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ABSTRACT

The articles in this report describe how field work, which is highly relevant to modern research and theory, can be used to improve geographic instruction at several instructional levels. Chapter one places the role of field work in geographic instruction in the broader context of contemporary theories of learning. The second chapter describes an introductory course in which basic geographic concepts are taught primarily by field work in the local area. Chapter three discusses the organization and operation of an in-term, on-campus field course for advanced undergraduate and beginning graduate students; such a course would be the capstone in which students apply the knowledge and skills which they have acquired in their other geography courses. The fourth chapter deals with a field seminar designed to provide practical research experience for graduate students who have already had some training in field work. The appendix is a personal essay on the operations of a geographical field trip. Also included is a bibliography of selected materials pertinent to the role of field work in geography instruction. (Author/DE)

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Field Training In Geography

COMMISSION ON COLLEGE GEOGRAPHY
TECHNICAL PAPER NO. 1

ASSOCIATION OF AMERICAN GEOGRAPHERS
Washington, D. C.

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FOREWORD

Field work in geography is neither magical, mystical, nor sacrosanct, although some practitioners appear to have tried to make it seem so; all geographical research need not be based on field work to be of good quality. But the rubric, "field work," has become canonized, and apparently it has created qualms of conscience among some geographers. A belief in the need for field work has been such a central ingredient in the value systems of many professional geographers that a surprising amount of effort has been devoted to attempts to stretch the definition of "field work" to cover a ludicrous range and variety of activities.

No useful purpose would be served by compounding confusion here. A narrow definition of field work would irritate those who feel that they should be doing it, and aren't; a definition broad enough to include these conscience-stricken souls would bother those who are trying to get on with the job. Suffice it to say that geography is an observational, not an experimental, science, and its observations must be made in "the field," whether this be the wind-swept wastes of Sahara or Manhattan's canyons.

How do geographers learn to make these observations? Although most geographers seem to agree that a field course is an important, if not essential, ingredient in an undergraduate major program in geography, only a few departments offer such a course. Only 97 (seven percent) of the 1,321 four year institutions reporting courses in geography in the 1965-66 Directory of College Geography in the United States provided any form of field experience, and 28 of these 97 were "study tours." Furthermore, only 1,584 (just over one-half of one percent) of the 294,014 students enrolled in geography courses (including an indeterminate number of multiple enrollees) were in these 97 field courses.

Why have geography departments failed to offer more field instruction? Part of the explanation may lie in the intellectual bankruptcy of many traditional "field techniques" courses and field camps, which stressed archaic methods and mechanical data collection rather than contemporary geographic research problems. Students were taught how to collect data, but not why the data were worth collecting. This report describes how field work which is highly relevant to modern research and theory can be used to improve geographic instruction at several instructional levels.

The first chapter places the role of field work in geographic instruction in the broader context of contemporary theories of learning. The second describes an introductory course in which basic geographic concepts are taught primarily by field work in the local area. This chapter contains suggestions which will challenge any thoughtful person teaching an introductory course in geography to think seriously about what he might and could be trying to achieve, and how well he is achieving his present goals.

The third chapter discusses the organization and operation of an interm, on-campus field course for advanced undergraduate and beginning graduate stukents; such a course would be the capstone in which students apply the knowledge and skills which they have acquired in their other geography courses. The fourth chapter deals with a field seminar designed to provide practical research experience for graduate students who have already had some training in field work.

The Appendix is a highly personal essay on field trips in geography. The Bibliography combines an attempt to up-date the bibliography in

Chapter 24, "Field Techniques," in American Geography: Inventory and Prospect, with a listing of some of the classic works pertinent to the role of field work in geographic instruction.

Although each author assumed prime responsibility for preparing the first draft of his chapter, each first draft was extensively modified after lengthy discussion with the other members of the committee, and the resulting chapter represents much more of a consensus document than the indication of individual authorship might imply. In addition, one or more members of the committee wish to express their appreciation for the ideas, reactions, or stimulation which they have received from a large number of colleagues, who, to avoid invidiousness, are listed in alphabetical order: Christopher Board, Harold Carter, the Committee on Institutional Cooperation, George Demko, Charles Dreilinger, William Emerson, Edward Espenshade, James Gallagher, Angus Gunn, Preston James, Clarence Jones, Peirce Lewis, James Lindberg, Fred Lukermann, Cotton Mather, Harold McConnell, Robert McNee, Marvin Mikesell, David Morris, Peter Nash, Edward Price, Clarence Olmstead, George Schnell, Richard Silvernail, Robert Smith, Howard Stafford, Edward Taaffe, Benjamin Thompson, Philip Wagner, Paul Wright, and last but not least, as always, Wilbur Zelinsky.

Kenneth E. Corey, University of Cincinnati
John Fraser Hart, University of Minnesota, Editor
A. David Hill, University of Colorado
(formerly at Antioch College)
Neil E. Salisbury, University of Iowa

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THE ROLE OF FIELD WORK IN GEOGRAPHIC RESEARCH AND INSTRUCTION

Kenneth E. Corey
University of Cincinnati

A belief in the importance of field work is an essential ingredient in the value systems of many professional geographers (McNee, 1967, p. 8-11). "Getting your boots muddy" has often been deemed necessary to the initiation rites of the geographer; in order to learn geography this way the neophyte must "develop an eye for country" (Wooldridge, 1955, p. 78). Over the last decade, however, the utility of field work in geographic instruction and research has been seriously challenged.

Some geographers have wished to know how field work can assist in the search for generalizations, theories, and laws in geography, since so much has had no theoretical base (Dohrs and Sommers, 1967, p. 184). Before considering how field work might be used in geographic instruction and research, therefore, it seems appropriate to ask whether it should be used.

Christopher Board, in comparing geographical field work in Great Britain and the United States, concluded that field research has been characteristic of geography in both countries, but that "field teaching, as distinct from field research, has had a peculiarly powerful influence upon British geographic work" (Board, 1965, p. 187), whereas "field work in American geography seems to have been identified much more with research than with teaching" (Board, 1965, p. 193). Before considering the role of field work in geographic instruction in the United States, therefore, let us examine the changing role of field work in geographical research in this country, with the thought that there may be similarities between the procedures and techniques of research and the procedures and techniques of learning and instruction.

Geographical Field Research

Theoretical vs. Empirical

American geographical research in the past has experienced periods of over-emphasis followed by periods of over-reaction to previous excesses. Much early geographic research, especially from the 1900's into the 1920's, was motivated by a search for generalizations (Board, 1965, p. 195-196). The wave of reaction to overly simplified deterministic explanations, however, tended to stifle efforts at suggesting fresh hypotheses (Haggett, 1966, p. 277-278), and this rather inhibited the search for geographic order and spatial similarity. Instead, much attention was directed to the study of variation between places, the "areal differentiation" approach (Ackerman, 1963, p. 434-437). Geographic research in the 1930's was predominantly empirical and oriented toward field work. A re-awakening of interest in theoretical geography after World War II may have been stimulated, in part, by a "wavelet" of reaction to the dominant research position that had been assumed by the "landscape school" (Hartshorne, 1939, p. 149-174) and the numerous field studies associated with it. Since the late 1950's much geographic research has been explicitly directed toward a more theoretical geography (National Academy of Sciences-National Research Council Publication 1277, 1965). This change in emphasis and its associated stress

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on geographic problem solving has stimulated considerable activity in model-building and theory seeking, along with increased use of the methods of systems research and statistical analysis techniques (Ackerman, 1963, p. 435).

Recently, in paraphrasing James B. Conant, the Ad Hoc Committee on Geography described the progress of science as a "dialogue between the empirical-inductive and the theoretical-deductive methods of thought and investigation" (NAS-NRC Pub. 1277, 1965. p. 12). The Committee argued that this dialogue has developed farthest within the "location theory cluster" approach to geographical research, which includes urban-economic-transportation geographers. With reference to field work, the Committee suggested that regional and historical geographers "are particularly qualified to undertake the field observation and field study of problems recognized in a more systematic way and to conduct field tests of generalizations arrived at through systematic study, as by the location theory cluster" (NAS-NRC Pub. 1277, 1965, p. 60).

An alternative means for achieving a better balance between the various research clusters in geography would be to suggest that other geographers should follow the example set by the geographers of the location theory cluster and strive toward more flexibility in their research. An attempt to achieve an empirical-theoretical balance within all research clusters of the discipline would be a more positive and productive approach than assigning regional and historical geographers the handmaiden role of empirical helpers to geographers of the location theory cluster.

Those geographers who have relied heavily on empiricism should develop and strengthen their competence in theory; conversely, those geographers who have stressed theory almost to the exclusion of empiricism should balance their approach by developing inductive-empirical abilities. When a balance between the empirical and the theoretical has been attained within each research cluster of geography, we might then begin to expect truly productive communication and a healthy balance between the research clusters of the discipline.

The entire discipline suffers as long as individual groups of geographers develop and refine one set of methods (e.g. empirical) to the virtual exclusion of the other set (e.g., theoretical). All geographers need to realize that both empirical and theoretical methods of instruction and research are essential elements of the same system of acquiring geographical knowledge; by viewing them as such, we are more likely to understand the proper role of field work in geography.

Procedures of Research

The frontiers of geographical knowledge are advanced by the characteristic methods of science, which are attempts to abstract from, and to generalize about, the real world. The ultimate goal of these procedures is to develop geographic laws by means of hypotheses and theories. A typical set of research procedures might be:

1. Initial recognition and formulation of a problem that has the promise of contributing to the building of geographic theory.
2. Collection of data as indicated by the specifications and constraints of the problem.
3. Cartographic and statistical analysis of the data.
4. Formulation of hypotheses derived from the analysis.
5. Testing of the hypotheses, which involves comparison of the hypothetical model with the actual reality upon which the model is based. If the

hypotheses do not pass the test, they must be reformulated and new hypothetical models built. This research cycle is a never-ending process of building and testing models. A hypothetical model becomes well established when it has been verified through numerous tests, and a touch of the sought-after universality is achieved.

Techniques of Research

The research geographer seeks to explain the world from his particular geographical perspective by means of his locational and spatial models. During these attempts, however, he is confronted with the infinite detail of reality. Since it is not possible to cope with such complexity, ways have been devised to select, reduce, and abstract from the real world in order to facilitate its study. These attempts are significantly eased when guided by theory, no matter how intuitive or how reasoned (Bunge, 1962, p. 2). The systems researcher recognizes a spectrum of research techniques which, if used skillfully, can greatly assist a research worker in his task (Steger, 1965, p. 168-169). The spectrum ranges from the specificity of the real world to the high abstraction of mathematical optimizing models. The spectrum includes the following elements:

1. The real world, which represents the totality of facts.
2. Selective observations and measurement from the real world. The research worker, having captured a small fraction of the real world by way of these observations, can experiment with them.
3. Simulation models of the real world, with the objective of partial imitation of the real world in order to manipulate and analyze part of it. Different kinds of models serve to describe, to analyze, and to forecast or project the real world.
4. Mathematical optimization models, which involve optimizing and obtaining "best" solutions to problems of decision theory, resource allocation, and strategy-calculation, among others. These are generally models with closed analytic solutions.

By organizing available research techniques according to this spectrum, the research worker can more easily select the technique or set of techniques that is most appropriate to the solution of his particular research problem as it evolves and unfolds. Steger says "one notion of increasing practical importance is that of 'playing the spectrum of techniques,' interweaving the uses most appropriate to the general environment being simulated and the knowledge of the user or model-builder" (Steger, 1965, p. 169).

Sources of Data

Many research problems have been directly inspired by personal experience in the field, by the observations of others, both spoken and written, and by ideas and models, both those formulated by others and those formulated by the research worker (Board, 1965, p. 191). Where do the factual data come from that are used to solve research problems? An organizational framework for sources of locational information in human geography has been suggested by Haggett, (Haggett, 1966, p. 186-187):

1. Field observations, including qualitative observations as perceived by sight, hearing, smell, and perhaps touch, and quantitative measurements.
2. Archival sources, including maps, air photographs, census data, other government records, newspapers, and the like.

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3. Theoretical work, including mathematical models, and analog models such as physical simulation models and Monte Carlo simulation models.

The degree to which these sources of data are used has varied considerably over time. In the first forty years or so of this century most American geographic research was stimulated by and premised on field work. The pattern has changed in recent years. In the 1960's the geographical literature shows a clear trend toward an overwhelming reliance on secondary sources of locational information. "It is difficult to make precise estimates, but a rapid check of locational research published in geographical periodicals over the last five years suggests that this source still accounts for over 95 percent of our work" (Haggett, 1966, p. 185-186).

With the reawakening of theoretical interests in geography, a heavy dependence upon secondary sources for hypotheses and data, and a concomitant dormancy in field work, have geographers been too willing to accept and to use secondary sources which are often non-geographical in organization, collected according to areal units at a scale inappropriate (the problem of modifiable units; Berry, 1965, p. 151) to the problem at hand, or questionable in quality, both in terms of accuracy and design? In short, do many of the hypotheses and much of the data of geography depend upon sources that are not of specific geographic design, and beyond the direct control of geographers?

Haggett pleads for exploring alternative and complementary sources of geographical information, and offers two such alternatives, field work and theoretical work.

> Field collection . . . represents a return to a tradition which was the hallmark of nineteenth century geography. . . . Less traditional is the possibility of information from theoretical work in which locational conditions are simulated either by mathematical models, by physical models, or by Markovian sequences. Of the two alternative sources, that of field work offers the best immediate solution in that it promises to give, at least when linked to rigorous experimental designs, directly relevant information on the applicability of existing locational models. At the same time it provides data which can be tested, extended, and manipulated in theoretical work. (Haggett, 1966, p. 186-187)

Haggett's statement is an attempt to consider the relationships and sequence of field work and its place in the broader system of sources and methods of geographical research. Each source of locational information in human geography is viewed as a related part of a whole system of information sources. This approach, a rather recent development in geography, is indicative of contemporary attempts to begin using the full range of systems methods. Compare it, for example, with the chapter on field techniques in American Geography: Inventory and Prospect, which states that there are four sources of factual information in geographic research: "1) documents, such as maps, ground photographs, statistics, and written materials; 2) air photographs; 3) direct observation; and 4) interviews with informants" (Davis, 1954, p. 497). The major difference in Haggett's addition of the "theoretical" information source, although he does fail to make any explicit mention of interviewing.

Geographic Field Instruction

Processes of Learning

Each of the three elements (procedures, techniques, and sources of data) in research discussed above has a common thread; it is marked by

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a tendency to range from the empirical and inductive to the theoretical and deductive. Is the same true of learning and instruction? Is there a similar sequential pattern to the processes, the techniques, and the data sources of learning and instruction? If so, this is an important point, because some scholars maintain that geographic learning can be facilitated by teaching in such a manner that the student acquires knowledge in much the same way that it is acquired by a professional research geographer.

Studies by psychologists and educators indicate that human learning is more significant and lasting when the formation of concepts and principles is emphasized, in contrast to the traditional teaching approach which has stressed facts and schemes of classifications. Concepts are important to the student because they enable him to operate within a pattern of general principles or hypotheses. Concepts, generalizations, and principles encourage the student "to understand something as a specific instance of a more general case; to learn not only a specific thing but also a model for understanding other things like it" (Bruner, 1960, p. 25). In short, concepts facilitate the transfer of a generalization from one specific problem-solving situation to another. Assuming that concept formation is indeed basic learning, then how are concepts formed, and how can they be taught?

Asahel D. Woodruff says

> Abstractions, generalizations, and principles are all inventions of a mind, and they remain in the mind that invents them, where they operate as ways of understanding what is seen. These inventions must be made by each mind for itself; they cannot be transferred from a teacher to a student, or from a person to any other person. They cannot be perceived for the first time in a lecture or in a book. They can be recognized in the lecture or book, if one has them even in crude form when he approaches the verbal experience. (Woodruff, 1966, p. 5)

Woodruff has outlined the following processes and levels of development that are important in learning, and says that "they operate in a definite order, as if they were in layers, and that order cannot be violated" (Woodruff, 1961, p. 125):

1. Perception. In order to form a concept, the student must have the raw material to construct a mental image. This conceptual raw material is acquired by direct sensory contact with the thing which is to be conceptualized. A percept, or meaningful sensory impression, is acquired through touch, tongue, nose, ears (through sounds but not language), and eyes (through observation but not printed words).

2. Conceptualization. Concept formation is a non-verbal process, and the verbal statements of concepts which occur after perceptions have been made are not concepts, but only the verbal approximation of an idea which is in the student's mind. Conceptualization involves organizing concepts into meaningful patterns of mental images. Woodruff identifies the following sublevels:

a. differentiation—recognizing clearly;

b. integration—identifying functional relationships to other things;

c. generalization—identifying structural similarities with other things; and

d. abstraction—identifying qualities and dealing with qualities apart from the objects in which they are found.

3. Practice. This involves trying out the newly formed concepts in real situations.

4. Analysis and creation. Here the learner experiments, manipulates,

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and empirically tests the newly formed concepts. Three sublevels are identified:

a. analysis–breaking wholes down into elements;

b. synthesis–producing new combinations; and

c. evaluation and problem-solving–testing and developing hypotheses.

Woodruff's schema points up the truly fundamental nature of perception of the real world, both directly in the field, and in the classroom through effective portrayal of reality.

Techniques of Instruction

Knowledge of learning processes leads directly to a strategy for instruction and a consideration of the teaching techniques which support concept learning. The following teaching techniques suggested by Woodruff are closely associated with the levels of learning which he proposes:

1. Show. The teacher facilitates perception either by bringing the student into direct sensory contact with the thing to be conceptualized, or by having the student directly perceive a good portrayal (such as an audio-visual aid) of the thing to be conceptualized. Such a teaching technique would emphasize field experience designed to give the student a specific opportunity for perceiving selected portions of reality "for the first time," so to speak. This suggests that "introductory" field trips, even without prior preparation of the student, but with proper guidance by the instructor, may be useful in initiating formation of geographic concepts by the acquisition of percepts in a structured context.

2. Discuss. At this level instruction is designed to assist the student in organizing his developing concepts of reality by thinking consciously about his sensory impressions. Teacher-guided student recall, review, and elaboration are used to combine new perceptual experiences with past experiences, and teacher-directed drills in symbols and data memorization provide the student with a verbal shorthand for the developed concept.

3. Guide original thinking. The teacher aids the student in the recognition, investigation, and evaluation of the newly formulated concepts, and in their application to more general situations. The recognition, study, testing, and application of concepts will often require student field work. At this level the learning process of students is remarkably parallel to the problem solving process used by professional researchers, which supports the view of some scholars that the proper approach to teaching is to expose the student to the structure and subject matter of a discipline, and also to the methods and techniques of the discipline, in order to help him understand the discipline's way of knowing (Bruner, 1960, p. 17-32).

In geography the field is important in all three of these teaching techniques, but it is especially useful for "showing" and for "original thinking." Initial perception occurs best in the field, and the testing of many hypotheses requires collection of field data.

But even when they have used the field for geographic instruction, American geographers often have failed to take full advantage of its potential. Field trips have been more common then field work (Hutchings, 1962, p. 1-4), and in the field, as in the classroom, undue reliance has been placed on indirect or transmitted learning. Transmitted learning is most meaningful after the learner has begun to form a mental image or concept of reality. It is significant in concept communication, "but only if the concepts to be communicated are already possessed by both the sender and

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the receiver" (Woodruff, 1966, p. 4). Students are generally exposed to direct sense-oriented learning in elementary education, but in secondary schools and colleges they experience lecture-demonstration teaching almost exclusively.

The student who receives a steady diet of book and lecture "authorities" begins to become skeptical of learning by "non-authoritative" methods, and even skeptical of his own personal observations. Although formal education makes half-hearted concession to the principle that knowledge which is as reliable as anything in books can come from personal observation and experiment, in practice it overwhelms students with ever-increasing quantities of printed subject matter and conclusions reached by authors (Hutchings, 1962, p. 2).

Meaningful learning occurs only when both direct-observational and indirect-transmitted types of instructional methods are used. The sequence of methods is important. Preliminary learning requires direct-observational methods, but intermediate learning demands indirect-transmitted methods, and in the later stages both must be used in reciprocal and alternating combinations, as when hypothesis testing and revision occur.

A balance between the two is clearly desirable, but it does not currently exist. It will be necessary to change traditional teaching patterns in order to achieve a healthy balance between direct and indirect methods. Teachers who rely almost exclusively on lecture-demonstration methods in the classroom must make every effort to get their students into the field for problem-solving and hypothesis-testing activities, but this does not negate the need for some field lecturing, nor the need for discovery learning in the classroom.

Conclusion

Geographic research and geographic instruction are parts of a single system, the acquisition of geographic knowledge. Knowledge becomes more complex as one progresses from the elementary levels of geographic knowledge to the more advanced ones, but the ways of acquiring knowledge are essentially the same. Research clearly represents more advanced learning, but the conclusions of research should be incorporated into the more elementary instructional sectors of the geographic knowledge system.

Field research and field instruction in geography have been discussed separately because they have developed separately in the United States. Despite their different development, however, they have similar and parallel procedures, processes, and techniques. The identifiable parallels include: (1) the objectives of geographic research and geographic instruction are to generate general ideas about reality; (2) geographic research and geographic instruction draw upon a spectrum of techniques that extends from the directness of real world observation to the abstractness of symbolic models and tentative hypotheses; (3) field work can and should play an essential, central, and plural role in geographic instruction and in geographic research as a catalyst, as a data source, and as a yardstick by which hypotheses may be evaluated; (4) field work is neglected today in geographic research and in geographic instruction. Research suffers because of this neglect, and instruction resulting from this research suffers doubly; research theories are emasculated by lack of field enrichment, and concepts are taught in isolation from the reality of the field; (5) the unbalanced condition of research and instruction in geography emphasizes the need for the inclusion and upgrading of field work as an essential element of the

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normal routine of both.

The task ahead is to achieve a better balance within geography by giving field work its proper role. A basic ingredient for upgrading the role of field work in geography is to open up a better dialogue on at least two fronts: between those who are oriented toward research and those who are oriented toward teaching, and between those who are perceptually-empirically oriented and those who are conceptually-theoretically oriented.

LEARNING GEOGRAPHIC CONCEPTS IN THE LOCAL AREA: AN INTRODUCTION TO GEOGRAPHY THROUGH FIELD WORK

Concept Formation and Field Work
- The Process of Concept Formation
- The Design of the Introductory Course
- The Utility of Field Work

Introductory Course Taught in the Field
- Orientation
- Organization
- Objectives

The Naive Perception Unit
- The Field Exercise
- The Seminar

Development of Basic Geographical Concepts
- "What is Geography?"
- A Basic Conceptual Framework
- Geographical Concepts and Universal Concepts

The Unit on the Local Rural Area
- Objectives
- Preparation
- Sample Questions
- The Seminar
- Individual Studies

The Unit on the Central Place System
- Concepts of Spatial Organization
- Population Distribution and Change

The City and the Metropolitan Region
- Potential Relevance
- Basic Concepts
- The Urban Field Trip

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LEARNING GEOGRAPHIC CONCEPTS IN THE LOCAL AREA: AN INTRODUCTION TO GEOGRAPHY THROUGH FIELD WORK

A. David Hill
University of Colorado
(formerly at Antioch College)

Although often we cannot justify what we do, we keep trying what seems empirically to approach the attainment of our goals. This probably has been true of the use of field instruction in college geography, although field instruction has not been employed to any large degree, especially in introductory courses. The findings of recent research on the learning process, however, suggest that field work is theoretically a highly effective vehicle for concept formation in geography, and that it can be especially useful at the introductory level The first part of this chapter explains what I have been doing to introduce college freshmen to geography and why I have been doing it that way. The second part is a sequence of units to illustrate the geographic ideas I try to teach at the introductory level.

Concept Formation and Field Work

The Process of Concept Formation

Teachers of geography must consider many variables in making their decisions on the ingredients in their courses. Philosophical and administrative variables are regularly considered in planning curricula and individual courses, but another set—too frequently neglected—focuses on the student and how he learns. A most important question which must be asked is this: Given what is known about the learning process, how can the course be taught so as to achieve maximum learning? Although philosophical and administrative considerations must in part determine the eventual approach, the probabilities of learning diminish as they are permitted to supersede the requirements of the learning process.

One very early and critical choice the teacher must make is between an emphasis on transmitting geography's "body of knowledge," or an emphasis on aiding the student to develop his own body of knowledge related to how and why geographers do as they do. Geography's body of knowledge —the subject matter—is so large that no series of courses, let alone any single course, can contain it, and thus any selection from this cornucopia may be quite arbitrary. In order to learn, the student must develop his own body of knowledge; what he himself conceptualizes is more personally meaningful and is retained longer than anything else. The teacher's role is to guide the student so that he develops his own body of knowledge; if the teacher decides that his goal is teaching the "conceptual structure" of the discipline, then his role is to guide student learning by structuring his course so that the student learns both how geographers learn and why geographers do what they do.

The process of percept acquisition and concept formation described in the first chapter is basic to the pedagogic approached followed in this one. Geographic facts, the subject matter of geography, or what is to be perceived by the student, consist of concrete and specific objects on the earth's surface, engaged in concrete and specific events, which produce specific consequences on that surface. The student can be overwhelmed by the quantity of geographic facts to the point where he is able to assimilate and retain very little. To teach is to engage the student in conceptua-

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lizing from his perceptions of the subject matter, and to see that he selects those facts that will enable him to discover the characteristics of the concept. The teacher provides structure in this process by giving the learner some foreknowledge of what to look for in new stimuli to his perceptions.

Bruner says that "if facts [are] to be grasped conceptually and readily transferred to new instances, then it is better to learn the basic conceptualization by induction from particular instances. In this manner, a learner grasps both the generalization and a range of its applicability at the same time" (Bruner, 1966, pp. 205-6). Beyond these basic guidelines, then, we have only to provide the needed final stage in concept formation, that is, empirical testing of those concepts in various situations.

The Design of the Introductory Course

Three important considerations must be kept in mind when designing an introductory geography course. First, it has been argued that learning in geography should proceed from the study of local to extra-local areas, from large scale to small, in order to enable beginning students to make the direct perceptions which are so theoretically crucial to early concept formation. The field approach attempts to capitalize on what is now known about the learning process.

Second, a basic set of geographic concepts must be developed. Since the subject matter of geography is also the subject matter of other disciplines, it is necessary in the introductory course to emphasize those distinctive interpretations of the subject matter that are made by geography. Furthermore, it is important to distinguish between geographic concepts and the types of abstractions used by other disciplines, such as order of magnitude, typology, function, or process. These are examples of fundamental constructs, and although heavily used by the geographer, they are not exclusively within his purview. For example, region and areal association are more exclusively geographic concepts than are process or function. The beginning student must clearly understand this distinction in order to begin to develop an understanding of the nature and uniqueness of the discipline of geography.

Finally, the problem-solving approach fulfills the need for the student at the introductory level to learn to work with the scientific method as well as to use geography as a subject that is very directly concerned with important problems of mankind. Bruner writes that "the most 'natural' unit one can isolate in intellectual activity consists first in sensing a problem," (Bruner, 1966, p. 210), which is to say that learning is most likely to occur when a course is problem-oriented. McNee suggests that because of the quick obsolescence of geographic "truths," "habits of inquiry, positive attitudes toward problem-solving, are of more utility to the student in the long run than memorization of the conclusions of a particular point in time" (McNee, 1967, p. 3). When emphasis is placed on learning the "body of knowledge" that has accumulated in geography, the student's reaction often tends to be passive or even negative. He feels that "what's done is done," that somebody else has already done all the interesting things; so much so, in fact, that if he is coerced into mastering existing knowledge he will feel that he has almost no time to think of new knowledge to be acquired.

The Utility of Field Work

Field work has great theoretical utility for concept formation, since the field provides an opportunity for direct sensory perception. Guided by

the teacher, the student can readily formulate geographic concepts from his own perceptions in the local area. The oft-noted adage that one should get to know some place intimately in one's geographic education has not generally been taken seriously in introductory courses – this pleasure is reserved for graduate students. When field work is emphasized in the introductory course, the local area can provide the subject matter, and the student can become "intimate" with it. When the student understands that the subject matter can be found in the local area, the sanctity of the printed word is not a threat to his inquiry, and he is more likely to ask critical questions and to formulate original ideas than when his attention is riveted to a textbook. Furthermore, when concepts are formulated from directly sensed perceptions, the links to the "real world" are explicit, personal, and direct, and the student is more likely to make further "real world" applications of those concepts.

Virtually any local area contains phenomena from which to formulate a minimum set of the most basic (i. e., widely used and generally accepted) geographic concepts, such as spatial distribution, spatial interaction, etc. Indeed, the ubiquity with which concepts can be applied is a test of their basic value. If a student learns a basic structure of geographic concepts through direct perception in the field, he will be very likely to apply it in future geographic study. Such a set of concepts is highly susceptible to reiteration (the reinforcement theorized to be so essential to idea retention) without contrived structuring because the phenomena upon which they are formed are recurring. Once the set is learned, the student is more likely to apply it to other geographical locales.

The field experience should be integrated with lectures, demonstrations, readings, programmed units for independent study, and other pedagogical devices. The seminar or discussion group, articulated with field work, provides a format in which the learner can verbalize and get immediate feedback on the conceptions he is developing from his field perceptions. Furthermore, introducing geography through field work in the local area does not preclude later concentration on more remote areas. If only a short time is available, then the entire period can focus on the local area, but with more time the focus might be shifted to another area in the latter portion. Field work then becomes more and more impractical, and greater reliance must be placed on secondary sources of information such as textbooks. The latter, however, provide an opportunity for comparison and further testing of the concepts developed in the local area.

An Introductory Geography Course Taught in the Field

Orientation

Today's good college student is particularly distinguished by his search for "relevance." In fact, he has become known as a rebel because he, perhaps more than students of earlier generations, demands relevance. Although there is a degree of rhetoric in this, the geography teacher, in order to reach these students, especially in his introductory courses, must demonstrate the relevance of geography to the complex "real world" wherein the student is seeking relevance. He must make explicit the links between geographic facts, principles, or theories and those problems that hold immediacy and relevance for the student. The teacher cannot expect to capture the student's imagination with the highly abstract or technical ideas that fascinate the professional.

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Perhaps the most basic fact responsible for the continuation and stimulation of geographic research and teaching is the fact that the surface of the earth, the subject matter, is constantly changing, and any introduction to geography should highlight this all-important idea. Herein lies an exceedingly challenging opportunity for the geography teacher. A student's sense of relevancy may be aroused by a course focussed on a theme or problem that stresses geographic change, such as a course entitled "The Changing Occupance of the (Local) Area." The overriding, or "course," problem, might be stated thus: What major changes are occurring in man's occupance of the (Dayton-Yellow Springs) area?

Concentration on a problem is intended to engage the student in geographical discovery that he can perceive as being pertinent to understandings at the present time and in the local situation. These are what Bruner calls the "extrinsic rewards" of problem solving. And most students seem to enjoy, to some extent, the intrinsic rewards derived from the very act of problem solving.

Organization

Probably no course outline of manageable length can adequately describe what actually happens in the course, and that is undoubtedly the case with the series of units described here. The previous section was intended to give a sense of the pedagogical philosophy employed throughout these units, however, and it is hoped that those ideas will serve anyone trying to conjure up the reality of classroom and field activity.

These units comprise a "course" for college freshmen that I have experimented with, using a seminar format, in my own local area (in the eastern part of the Corn Belt in close proximity to an urban area of nearly half a million people—Dayton, Ohio), but insofar as possible, the units are presented here as they might be applied, at least in part, to any local area. In this "course" the student is introduced to modern concepts in geography in a program that uses seminar meetings to articulate observations made during organized independent and group field work in local rural and urban settings.

The seminar is organized around a single theme expressed as the Seminar Problem: What changes are occurring in man's occupance of the local area? The problem is attacked and re-defined inductively and in stages by making observations, posing sub-questions, and investigating hypotheses at increasingly higher levels of spatial organization. We begin with a simple unit of occupance, the individual farm, then shift our focus to small central places, and finally consider the city and its region.

Major emphasis is placed on data collected by direct field observation at each stage. Seminar periods include some lecture-demonstrations, but they are used primarily for discussions to clarify and re-define problems and concepts, and to analyze field observations. Required readings provide conceptual background for the various phases of the Seminar Problem, and supplementary readings are suggested. Each student is expected to purchase a set of U.S. Geological Survey 7.5 minute topographic maps covering the local area. They work on written questions that accompany group field work, and on problems using statistical and cartographic analyses.

Objectives

The objectives of the seminar are:

(1) To provide the student with a set of basic geographical skills, concepts, values, and modes of interpretation that will prove relevant to his need to understand the rapidly changing world. Among these are skills in direct observation and the use of statistics, air photos, and maps; understanding the use of geographic models; recognition of geographic problems and of the implications of shifts in the scale at which these problems are observed or stated; and experience with types of geographic interpretation such as spatial association, spatial interaction, and regionalizing.

(2) To sharpen the student's perception and appreciation of the changing geographic landscape, and of the cultural, economic, and social meanings that derive therefrom.

(3) To introduce the freshman student to the rural and urban sectors of the college's local area in order to enhance his understanding of the environment in which he will be spending much of his time in the next few years.

(4) To pose a number of problems relating to man's occupance of the local area, such as those attendant upon agricultural modernization and urban growth, and to bring geographical interpretations and analyses to bear on these problems.

The Naive Perception Unit

The Field Exercise

As an initial assignment, each student is asked to observe and record his perceptions along an assigned transect or in an area close to the campus. He is given little or no direction as to what is to be observed or how he is to record his observations, although he is encouraged to experiment with "other than strictly verbal means of communication." This "naive perception" unit gets the student into the field immediately and forces him to differentiate among perceptions—to look and to think about what might be important to observe and record. For the follow-up seminar he circulates a summary sheet of his recorded observations to the other students and the instructor so that the various approaches to the same problem are shared.

Several ideas are developed in a discussion of this assignment. Since the assignment is made in a "geography" course, the phenomena recorded give some indication of the individual students' naive concepts of "what is geography?," because they have only their separate notions as to what is expected of them. Thus, even when the transects or areas are very similar, the recorded observations will vary from student to student. Some will record primarily physical features, such as topography or vegetation, whereas others will dwell on various aspects of cultural elements. Despite the individual differences in perceptions and observations, however, many agreements, which derive from the basic similarities of the perceivers as well as of the subject matter, emerge from the group. Thus, for the group as a whole there is a "core" where perceptions overlap; this pretty much defines the shared beliefs about "geography" that are held by this group of college freshmen.

The Seminar

In their summaries some students will use various types of abstractions and even, usually unknowingly, basic geographical concepts; I focus on

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these and use them as vehicles for brief forays into geographical concepts. For example, a student's observation that several houses on his transect were "run down" may lead into a discussion of classification and/or spatial distribution, perhaps using as an example the classification of residences, and a map showing their distribution, which were made in studying the need for urban renewal. The instructor must be prepared to capitalize in the seminar discussion on the "data" represented by the students' perceptions so that geographic concepts can be developed and later reiterated. For example, he can ask why houses, as recorded on transect X, are "run down" as compared to houses on transect Y, in order encourage the students to think about why phenomena may vary between some places but be similar between others.

The techniques of recording data will vary. Some students may even make a map, although most will not, the earlier clue to them notwithstanding. If, luckily, someone did map his transect, this provides an opening for a discussion of why mapping is useful, how it is so aptly fitted to recording data, how the quantity of data recorded can be increased by map use, and of the utility of maps in suggesting problems and solutions. At this point one might wish to introduce some basic mapping techniques such as the use of the fractional code or other methods of symbolization. If the students are evidently weak in basic map skills some map assignments can be useful at this point. These can suitably be based on the local area topographic sheets which the students have purchased.

If time allows, it is useful to go back into the field with the students to lead them along a transect, perhaps demonstrating some basic elements of field mapping, to point out certain important percepts and to pose such questions as "what is that, why is it there, where might it have come from, and when?"

In the seminar and/or group field trip following the individual "naive perception" exercise, I begin to pose questions about geographic change in the area. It is here that the student begins to try to verbalize concepts based upon the perceptions made in doing the assignment. I emphasize to the students that I want them to formulate their own concepts from their own perceptions, and I illustrate this by using examples from their own observations. During this unit the student does some general introductory reading about the nature of geographic inquiry.

Development of Basic Geographical Concepts

"What is Geography?"

The second unit stems directly from discussion generated by the students' first transect problem. It best follows that initial field experience, because students can then use some concrete examples. The purpose of the unit is to suggest means whereby the subject matter and problems to be dealt with later can be viewed geographically. Probably every geography teacher tries to deal at least partially in his courses with the question, "what is geography?," but there are many arguments against presenting a priori definitions. In the first place, there probably is no single definition that geographers could agree upon and students would be able to understand. Secondly, conflicting definitions lead to philosophical and theoretical arguments that the beginning student often sees as irrelevant. Furthermore, giving definitions which must be memorized is contrary to the principle that students should formulate their own definitions of geography.

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A Basic Conceptual Framework

It is one thing to struggle with definitions, and quite another to begin to build what I think is essential in the introductory course, a conceptual frame of reference that is as generalized and as universally applicable as possible. Thomas' "A Structure of Geography," in my opinion one of the most applicable frameworks currently available, is comprised of the following concepts: geographic fact, spatial distribution, areal association, spatial interaction, and region (Thomas, 1965). Although this structure was developed for geography at the high school level, it provides a distinct and unique frame of reference that differentiates geography from other disciplines, and thus it has utility for college geography.

In the second unit considerable instructor guidance is required to generate student discussion in developing the concepts contained in Thomas' framework. Examples from the students' work on their initial assignment are used wherever possible, but additional information about the local area is provided as necessary. Examples are chosen to demonstrate that the concepts are applicable in any of Pattison's "four traditions" (Pattison, 1964). I point out that I stress one or more of these "traditions" above others in this particular course because of my own training and interests, but that other geographers legitimately emphasize others. The basic geographical concepts, however, are applicable whichever set of "traditions" one chooses to follow or, to put it another way, no matter what the subject matter interest or the geographer, he brings to bear on his material a distinct frame of analysis.

Geographical Concepts and Universal Concepts

These geographical concepts are distinct from the more universal types of abstractions that all disciplines, including geography, make use of. In order to clarify this distinction, I try to develop in the discussion a list of concepts (such as level of generalization, order of magnitude, morphology, function, and process) with both geographical and non-geographical examples. It is also useful to point out certain geographical concepts which are special cases of universal constructs: scale, for example, is a special case of order of magnitude. Furthermore, one can also illustrate how various fundamental types of abstractions are used in the framework of geographical concepts. Consider, for example, the geographer's use of morphology, typology, function, and process when he studies an areal association.

A final distinction needed in this unit is the fact that the concepts in Thomas' structure are descriptive rather than explanatory, and this leads to a discussion of explanation in geography. Examples of common procedures using the descriptive concepts to arrive at hypotheses or explanatory models can be introduced into this discussion. Although these examples could be drawn from the geographical literature, in choosing examples a strong bias toward the local area best serves the purposes of the course.

The Unit on the Local Rural Area

Objectives

This unit focuses on the changing character of rural occupance in the local area. Student activities are structured around group and independent

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field work, readings, and seminar discussions. While the students are expected to try to develop hypotheses to explain changes in rural occupance, the unit is also a vehicle for further introducing them to such facts, skills, and concepts as: physical bases for settlement; recognition of spatial distributions and associations of both physical and cultural phenomena; changing patterns of occupance over space and time, including their relations to physical and human origins and the diffusion of cultural traits and complexes; agricultural analyses, including observation and interviewing; interaction of basic occupance units (farms) with service centers; important processes of occupance change, such as agricultural modernization and urbanization; map and air photo interpretation in the field; and the construction of maps and cross sections.

Preparation

The field work itself should be as detailed and analytical as time permits, and thus I have to content myself with a single day in the field with the entire group. This is followed by student work either individually or in small groups. Major preparation for rural field work is accomplished in a seminar meeting, although students are also asked to read some local history and works dealing with agriculture which are pertinent to the local area. Emphasis is placed on the central idea of the course, namely, the attempt to recognize occupance change.

Students are involved in planning the itinerary for the entire group day in the field whenever time permits it. Preparation includes going over the itinerary on the topographic quardrangles of the local area. This provides an opportunity to ask questions in order to discover the extent to which the students understand these maps, and to answer questions they may have about map reading and interpretation. Since students differ widely in their ability to comprehend and use topographic maps, it is useful to have available some selected references and a brief map interpretation exercise for those who appear to have difficulty in mastering map reading skills.

A set of questions about phenomena to be observed is circulated and discussed during the preparation seminar. These questions are ordered in a sequence corresponding to the itinerary. They are posed to stimulate the students' observation and to elicit thought and discussion, both in the field and subsequently in the seminar. Some questions ask the student to generalize about certain observations made in the area, while others are more nearly concerned with individual observations made at specific places. These questions by no means exhaust the range of possible geographical inquiry into the phenomena to be observed.

Sample Questions

Here are some examples of the kinds of questions asked in the local rural area:

(1) What is the difference in the compass orientation of roads and field boundaries north and south of the Little Miami River? What explanations for this difference can you suggest?

(2) What relationship do you see between the distribution of permanent pasture and physical features in the area? How might this be explained?

(3) Describe the general agricultural pattern of the area by specifying associations of principal crops and animals, and other farm activities. What sorts of variations are found?

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(4) Comment on the range and spatial distribution of family income in the area. Can you perceive and account for any spatial patterns?

(5) Comparing the towns of Yellow Springs, Clifton, and Cedarville, which seems most closely linked to the surrounding rural area? Elaborate.

(6) What do you foresee as probable changes in the patterns of occupance of this area in the future? Elaborate.

(7) What in the business district of Yellow Springs indicates that the village contains a small, coeducational, liberal arts college?

(8) What reasons can you suggest why early white settlers chose to occupy the site of Clifton?

(9) Why do you think Yellow Springs has grown so much larger than Clifton?

(10) What types of external connections does Clifton have? Elaborate.

(11) What do you think Clifton's form and function will be in the future?

(12) How does land use on the top and sides of the Pitchin Moraine differ from land use in the adjacent valley? How would you explain this?

(13) How would you explain the presence of solitary trees in various cultivated fields?

(14) What relics on the landscape can be seen here? What was their original function? Why aren't they still used?

(15) What effect do you think the Interstate highway is having on the various towns along the old U.S. highway? What evidence have you for this opinion?

A visit to a local farm is arranged as part of the rural field work, and students are given a series of questions to help them in their interview with the farmer. A useful checklist of questions for the farm visit is contained in the chapter on "The Local Countryside" of the Local Geography Reference Volume published by the High School Geography Project.

The Seminar

Discussions following the rural field work focus on the students' hypotheses regarding occupance changes. The field questions encourage discussion and lead to further questions. I must be prepared to respond to the students' ideas, and to worm out their suggestions as to how their hypotheses might be tested. This provides an opportunity to guide discussion toward the procedures and techniques of geographic research. The students often decide to capitalize on the experience and opinions of local resource people such as farmers, businessmen, newspaper men, or the officials and technicians of public agencies. The class might even organize a colloquium with such people on a topic such as "the future use of land in the local area."

A key concept to stress is the fact that the basic occupance unit in any rural area (the farm) is the place where individual decisions are made which shape the rate and direction of occupance change, and that these individual decisions aggregate into general patterns which are explainable by major physical, social, economic, or political forces. By using maps of agricultural phenomena, one can demonstrate how the types of agricultural patterns found in the local area are more generally distributed, and thus work toward the idea of agricultural regions based on spatial distributions and associations. Central to this, of course, is the concept that the basic occupance units (farms) aggregate into agricultural regions.

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Individual Studies

If there is enough time in the course schedule at this point, much can be gained by organizing the class for individual or team field work to study several farms. This allows students working independently to make comparisons of agricultural patterns, to see similarity and diversity, and to get first-hand experience with the individual approaches and perceptions of the farmer/decision-makers. The urban bred student often is fascinated with the farmer, and perhaps vice versa. The fact that students find satisfaction in gathering information and opinions from other people partially justifies inclusion of these studies. Since much empirical geography is based on this type of research, beginning students should have the experience of such encounters, provided that they understand the necessity of carefully defined objectives and design in good research.

In preparing for these studies, one should discuss techniques of research such as sampling, data collection, interviewing, and the use of maps, air photos, and documentary materials. The best approach is to have the field teams test hypotheses (preferably the students' own hypotheses) in the most rigorous way possible, but if time is lacking the students can probably gain an "appreciation" of hypothesis testing without the tedium of detailed sampling, counting, and the like.

Perhaps the greatest value of these individual studies is the fact that the students are able to see at first hand that decision makers often act on what appear to be highly personal rationales, but that general patterns do emerge in the aggregate. This concept is basic to an understanding of probability.

The Central Place System

Concepts of Spatial Organization

Consideration of the central place system is easily linked with the unit on the rural area, since farms interact with service centers. Interdependence of place and area, with spatial interaction along lines giving in turn more general levels of spatial organization is appropriately developed in discussion. The relative degree of dependency of central places on their immediate, continuous, and discontinuous hinterlands should be explored. Local manufacturing firms can usually provide the necessary diversity of examples. If time allows the students might make maps of local nodal regions based upon selected criteria. Students' perceptions of different-sized central places in the local area might lead to discussion of the hierarchical relationships between population size, function, and service area of central places. The central places in the local area provide an opportunity for students to collect field data to analyze these relationships.

Surprisingly enough, few college freshmen seem able to articulate satisfactorily their concepts of the difference between "rural" and "urban." With this in mind, it seems appropriate to ask students why occupance units are areally smaller in the town than in the countryside. One can ask them, for instance, to compare maps of urban and rural areas at the same scale to develop recognition of the urban characteristic of agglomeration in order to attain maximum accessibility to a center. From this follows the idea of functional distinctions of rural (primary production) vs. urban (processing, distribution, and service) functions. Cross-cultural and temporal compari-

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sons are needed to emphasize the disadvantages of the widespread use of numerical definitions of urban places, but students also need to understand that lack of functional data for central places often necessitates the use of such arbitrary measures.

Population Distribution and Change

After introducing the subject of population differences in local central places, the question of population change over time in these places is posed as follows:

> Population is increasing in the Dayton-Yellow Springs area, but some places are growing at a much faster rate than others. For example, Yellow Springs had a 43.8 percent increase in population in the period 1950-60, while Clifton, 3 miles away, had an increase of only 4.5 percent, and Bowersville, in the same county, had a decrease of 10.7 percent. How are such differences explainable? Is it simply a matter of chance, or is there some discernible pattern to these differences? If there is a pattern, what is it? Does it have a spatial dimension, that is, do rapidly growing places have common geographical characteristics that set them apart from places which are growing slowly or not at all? With these, and other, questions in mind, the problem may be stated in more general terms: What is the geographic pattern of population change in the Dayton-Yellow Springs area, how does this pattern help one to understand the area, and how does knowledge of the area help one to understand this pattern?

This problem is a further attempt to encourage students to develop hypotheses regarding change in the local area. It engages them in the use of census materials, descriptive statistics, and cartographic presentations, rather than directly in field work, however. The scope of the problem is so large that the time constraint of the course is a limiting factor, but a minimal approach would involve students in the compilation, computation, and cartographic presentation of a classification of the population size and rate of change of the area's central places, with some attempt at analysis.

The instructor can introduce appropriate ideas of change in relative locational advantages for production and residence, such as transport routes, technology, markets, labor force, raw materials, cultural site preferences, and the like. It is useful to make comparisons with other areas. To this end Hart and Salisbury have provided useful material for comparisons, plus a "primer" for a variety of statistical approaches to the management of population data in a geographical manner (Hart and Salisbury, 1965).

The City and the Metropolitan Region

Potential Relevance

Since most American college students today are city oriented, if not actually city bred, in their view the study of the city and its region has great potential relevance. The geography teacher is missing one of his greatest opportunities to interest students in his subject if he fails to capitalize on this potential interest. He needs to think carefully about how he will make explicit the links between goegraphic facts, principles, and theories, and

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those problems that have significance and relevancy for the student. In a course which stresses field observation in the local area, the teacher must familiarize himself with local urban conditions. He should feel challenged to engage the student in the development of new concepts and perspectives which will enhance his understanding of what he perceives is important about his urban environment. If the student can be led to see in the city geographic order where he has formerly seen only chaos, he will carry with him a greater appreciation of the value of his introduction to geography.

Basic Concepts

Examples of some of the kinds of basic ideas which are developed in this unit are:

(1) Relationships in the local area between agricultural modernization, the economic decline of the small rural town, the process of urbanization, and the increasing influence of urban society upon the entire population.

(2) The process of urban growth, and especially the reasons for the emergence of one particular place as the dominant city in the local area in terms of site and situation: physical bases for settlement, historical "accidents," transportation developments (including relative locational advantages), and the like.

(3) The "political city" and the "geographical city": urban sprawl, its characteristics, and attendant problems.

(4) The economic base of the city.

(5) City morphology: land use zones and their functional morphology, hypothetical models of urban morphology, location theory in relation to land use differentiation.

(6) Cultural and social differences in patterns of land use, attendant social problems such as ghetto developments, and approaches to solutions of these problems, such as urban renewal and redevelopment.

(7) City and regional planning.

The Urban Field Trip

In this unit, as in the previous ones, time is the limiting factor on field work, but at a minimum a carefully planned urban field trip can achieve significant results in getting students to look at the city in entirely new ways, with geographical perspective. As in the rural unit, a set of questions is designed to stimulate the student to observe and think about the Dayton area before, during, and after the urban field trip. Here are a few examples:

(1) What types of industry do you see between the freeway and the Great Miami River? How long do you think they have been here? Why do you think they chose to locate here? Why is this type of industry sought by many towns, including Yellow Springs?

(2) From your observations and readings, speculate on the effects of the freeway on the location and pattern of development of industry, commerce, and residences here.

(3) From this point sketch an outline of the skyline ("skyscape") of Dayton. Try to identify the uses of the individual buildings later as we pass through the central business district. What significance can you find in the skyscape?

(4) What kinds of land use are found along both sides of this section of the Mad River? How would you explain their concentration here?

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(5) Note the types of land use and enterprises along the Third Avenue transect into the center of the CBD. What patterns can you perceive? How would you explain the changing patterns along this transect?

(6) List the major types of enterprises along West Third Street and comment on their relative occurrence. What does this tell you about the socio-economic position or the cultural background of the area's residents? What are possible reasons for their concentration here?

(7) Note a change in the type of residence here. What does this tell you about changes that are taking place? What type of multiple dwelling units are being built here? Why here?

(8) What are the major types of land use along Main Street? Who are the major land users? Why this concentration of one type of use?

(9) Watch for a sudden change in land use here. What is the change? How would you explain it?

(10) Why do you think land values are so much higher here? What uses might be able to, and would want to, compete for this land? Why?

(11) Describe the distinctive characteristics of the urban fringe.

These questions, of course, do not come close to exhausting the range of possible geographic inquiry. They are presented here merely to suggest the range of that inquiry. One index of partial success with such an approach comes when a student confides that he had never before seen the city in this way. Having received a geographic introduction to the city, the student is better prepared to engage in independent study, to pose penetrating questions to local resource people such as planners and officials about city problems, and generally to deal in a more effective and intelligent manner with the urban environment. This is not to suggest that geography can cope with all of the problems of contemporary urban society, but rather to propose that geography can contribute important insights. And the challenges and problems of the modern urban scene provide a fitting and intriguing culmination for an introduction to the study of geography.

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THE UNDERGRADUATE FIELD COURSE

Objectives

Organization
- The Field Camp
- The Field Course
- The Field Trip
- The Size of the Group

Field Techniques
- Elementary Operational Techniques
- Sampling
- Interviewing
- Mapping

Organization of the Field Course
- The Problem
- The Faculty
- The Field Area

The In-term, On-campus Field Course
- The Role of the Instructor
- Introduction to the Field Area
- The General Problem Area
- Selection of a Specific Class Problem
- Preparation for Field Data Collection
- Spring vs. Fall
- The Research Report

Envoi

THE UNDERGRADUATE FIELD COURSE

John Fraser Hart
University of Minnesota

Objectives

Observation is the one most important benefit unique to field work in geography, and although it is not readily taught, it should be the core of any program of field instruction. The strategy of the course should focus on it, and each student must learn to appreciate the rewards of seeing what there is to be seen. Under the heading of observation, one might include an alertness in noticing features of interest, spotting and grasping the significance of unexpected features, looking for concealed evidence (such as subsoils, the backs of buildings, etc.), and finding clues to areal relationships and to relationships and processes at a given place.

Undergraduate field instruction in geography (which is also appropriate for beginning graduate students who did not have such instruction in their undergraduate programs) has the following major objectives:

(1) To develop a better understanding of the nature of things discussed in the classroom and read about in books.

(2) To enhance the student's ability to read the landscape, and to expose him both to the methods of the geographer and to such basic geographic concepts as spatial distribution, areal association, areal differentiation, spatial interaction, and the extremely difficult and complicated problem of generalization.

(3) To enable the student to experience the thrill of personal discovery. Although many bright minds have been attracted into geography by recent emphasis upon its abstract and theoretical aspects, geographers should not lose sight of the discipline's traditional attraction for those to whom the empirical and concrete are congenitally more appealing.

(4) To help the student learn to enjoy reading a landscape. Many people, including geographers, derive considerable intellectual stimulation and aesthetic satisfaction from working out of doors in contemplation of the complexity that is total reality. "Charles Darwin, after a most undistinguished undergraduate career, was finally aroused by tramps through the countryside with his botany professor" (Anderson, 1959-60, p. 8). A true field experience is a Socratic seminar in the open air, centering around observations, whether with or without the aid and guidance of an instructor.

(5) To help the student learn to distinguish between necessary and extraneous information. This is the time in his undergraduate education when he is most likely to be called upon to think through the formulation of problems, to do his own basic research, to collect and analyze data, and to put them into presentable form. Whether he wishes it or not, he is thrust into a personal learning situation, because he cannot depend upon others; in the field he must make his own decisions.

Organization

Undergraduate field instruction in geography may take one of three forms: (1) the field camp, usually held off-campus for a period of six to eight weeks during the summer; (2) the field course, usually held on-campus during the Spring (because the weather improves progressively during the term), which combines discussion sessions during the week with half-day

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or day-long field exercises on Saturdays; and (3) the field trip, covering part of a day, a full day, or an extended period of time, in which the student, either alone or with others (including an instructor in many cases), travels through an area to observe it at first hand.

The Field Camp

Each form of field instruction has its advantages and disadvantages. It can be argued, for example, that a student needs the six to eight weeks of a field camp to get past his first sense of dismay and even panic when he is first really faced with the enormous complexity of reality. The field camp permits sustained and intensive work on a variety of projects, and the prolonged period of close contact can build excellent rapport between students, and between students and faculty members. Conversely, it can be argued that a six to eight week field camp costs too much, both in terms of money and in terms of faculty and student time. Furthermore, the field camp can be plagued with vexing administrative problems because it is not scheduled at a usual and customary time and place of instruction.

The Field Course

The in-term, on-campus field course can be criticized for its choppiness and lack of continuity, because too much precious time each week must be spent recapping what has already been done previously. Furthermore, the student who has just started to make progress at the end of a field day may be frustrated by the necessity of dropping everything for a week. The field course can be a hardship for the student who must work Saturdays to finance his education, and an inconvenience for the one who wishes to participate in intercollegiate sports. Quite often, especially during the early part of the spring term or the latter part of the fall, miserable weather can be an obstacle to learning in the open. But despite these objections, however, the field course is the most intensive type of field instruction that can be offered with minimal problems, particularly with minimal administrative problems, and it is probably the type which should be recommended to the great majority of geography departments. Most of the comments in this chapter pertain primarily to such a course.

The Field Trip

Field trips probably vary more in quality than any other facet of instruction to which an undergraduate student of geography is exposed. A good field trip can be one of the most memorable and valuable experiences of his undergraduate career, but a poor one can be a complete waste of his time. (With this in mind, a statement on "Field Trips in Geography" has been included as Appendix A.) The two principal objectives of a field trip are to enable the student to see new things (or to see old things in a new light) and thus to acquire "percepts;" and to encourage him to generate ideas about the relationships between the things he has seen, and thus to think toward explanations and hypotheses.

The thoroughness of preparation by the instructor, and of the students, is probably the single most important factor in determing the value of a field trip. A field trip can assist the student, whether or not he has any prior knowledge of geography, in acquiring the "percepts," or meaningful first-hand sensory impressions, which are the essential raw materials

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from which concepts are developed. Most modern college students have already done a certain amount of travelling before they come to college, however, and if percept acquisition were an automatic process they would already possess quite an adequate supply; meaningful perception by the student requires skillful guidance by the instructor.

Of course one must recognize the fact that some competent professional geographers argue quite vehemently that field instruction – whether or not on field trips – should not be guided or structured. They believe that ideas are best generated in students simply by taking them out to see, hear, and smell things; and it cannot be denied that one of the field instructor's greatest thrills is the discovery of a student "who is asked questions by the field." The majority of professional geographers, however, believe that, although bright advanced students might observe relationships, or even start to search for hypotheses, in an unstructured field situation, the good beginning student and the poor advanced student is not likely to do either.

The Size of the Group

Academic administrators must be conditioned to accept the fact that field instruction has a high cost per student. The reluctant administrator can be reminded that the same is true of biological field stations, geological field camps, and many on-campus laboratories, but the cost of these is justified because they are essential ingredients of their respective programs, just as field instruction is an essential ingredient of undergraduate and graduate programs in geography.

The faculty/student ratio for a field trip is determined by the number of persons who can be comfortably accomodated in the vehicle which is used, but a field camp or field course has a maximum of ten students or less per faculty member (or experienced graduate student). This upper limit is set by the necessities of assistance and surveillance; an instructor ought to available to answer questions fairly shortly after they occur, and he must keep a watchful eye on each student in order to be able to turn him back before he makes too much progress in the wrong direction.

Field Techniques

A student in a field course is in an apprentice research situation; such a course provides him with an opportunity to practice what he has been learning in his other geography courses, and to integrate and unify his knowledge of geography by applying it to a specific research problem. The field course is only one segment of a complete undergraduate instructional program in geography, and the person who teaches it should not be expected to compensate for inadequacies in other segments. Contrary to the belief of some geographers, the field course is not the place to teach map interpretation, or statistical techniques, or research design; it is the place where the student applies his acquired knowledge of these skills to a specific research problem.

Furthermore, the field course is not the place to teach specialized skills, such as plane table mapping, which are used only by research workers in small segments of geography. In fact, contemporary professional geographic doctrine rejects the once pervasive notion that there is even a standard set of geographic field techniques, a common kit bag of tricks which all geographers must know and practice in the field. Although a limited number of quite elementary operational techniques are fundamental

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to most field work, geographers today are in wide agreement that the techniques used in any research project must be those most appropriate to the search for answers to the questions which generated the project. The specific techniques which will be learned and used by the students in any given field course will be determined by the problem or problems on which they are working, not by some master check list of field techniques, for none exists.

Elementary Operational Techniques

The three elementary operational techniques which all geographers use when in the field are observing, interviewing, and recording (including recording on maps). The student needs to have experience of all three in a problem oriented frame of reference. Within this frame of reference the instructor has the responsibility for stressing the interchangeability of these techniques from one problem to another, for emphasizing the fact that similar elementary techniques are used in solving many different kinds of problems, but that each problem also necessitates the use of more advanced techniques which may be peculiar to that problem alone. This objective might be achieved by having the class work on several disparate problems, and then examining the similarities of the elementary operational techniques used in solving them, despite the differences in the more sophisticated techniques which are used in the solution of each particular problem.

Sampling

An important, but sometimes neglected, aspect of geographic observation is sampling. Even if the field worker collects complete data from an area, he must be aware of the fact that his particular area is only a sample of a larger universe. Sampling need not be allowed to become complicated; it may be very simple and straightforward, but it must be systematic. The degree of complexity of sampling techniques developed in a field course is a function of the technical competence of the instructor and the students in the field of statistics. Sampling procedures and their variations are implicit in all field problems, and should be so treated, but specific instruction in sampling techniques probably is more appropriate in a statistics course than in a field course. Holmes has provided a useful discussion and bibliography for the geography teacher who is interested in learning more about sampling techniques (Holmes, 1967).

Interviewing

All students of geography need to develop skill in interviewing, the art of talking to people and obtaining pertinent information from them. The importance of interviewing to the student of human geography is obvious, but even the student specializing in physical geography may need information on such matters as the date of a catastrophic flood and its effects upon the landscape, the nature and function of erosion control or drainage projects, and the like. The information obtained in most, if not all, interviews should be recorded on maps if it is to have any geographical significance or utility.

Mapping

Perhaps the most distinctive set of operational techniques used by geographers in the field are those which revolve around the recording of

data on maps. The first point to be emphasized to the students is the vital importance of knowning precisely where they are, on the map and on the ground, at all times, for otherwise they will be unable to record accurately any information they obtain. And the instructor will quickly discover that most students, even those who have demonstrated skill in interpreting maps and aerial photographs in the classroom and the laboratory, need time to learn how to locate themselves on a map or aerial photo in the field, and how to follow a course or route by using one. A certain amount of map drill in the field is essential for most students.

Although few geographers indeed need to develop the skills required for surveying, or even those involved in plane table mapping, every field geographer needs to understand the simple trigonometry of triangulation; if the distance between two points is known, a third point can be located by determining its compass direction from each of the first two. This knowledge is essential to the preparation of simple notebook direction-and-distance maps, in the unusual instance when the field worker has to prepare his own base map. A simple sketch map which is perfectly adequate for most geographical purposes can be prepared with equipment as simple as a protractor and cross-section paper. The protractor is used to measure angles, distances are measured in paces, and one square on the cross-section paper is used to represent one pace on the ground. Furthermore, a protractor with a small weight suspended from its central index point by a black thread is a serviceable clinometer for measuring slope angles.

These rude substitutes for more sophisticated instruments are suggested only as examples to emphasize the fact that the students should not be permitted to become so engrossed in the mechanics of technique and instrumentation that they lose sight of the problem on which they are working.

Organization of the Field Course

The Problem

Good field instruction is problem-oriented. The field course should be devoted to the solution of problems of limited scope, but students should be made aware that "a compleat problem" cannot be solved. By focussing attention on problem solving, students gain experience in how to conduct research projects, and their reports may provide a basis for decision making by public bodies. Various student groups in the past, for example, have been exceedingly gratified when their final reports have been used by local municipalities in locating new schools, parks, sewers, and other facilities.

The actual problem or problems, and area or areas, on and in which students work in a field course are subordinate to two other considerations: (1) the instructor should be competent to give guidance and direction to students working on problems in that subject matter and in that area, and (2) the instructor should be enthusiastic about the problem on which the class is working. Although these are requirements for all good instruction, they are especially important in a field course. The second point is vital, because teaching a field course is the most demanding kind of instruction, both in time and energy, and one of the greatest problems associated with such a course is maintaining faculty interest and enthusiasm.

The Faculty

It is probably desirable to divide responsibility for the field course between two members of the faculty, each of whom teaches it for several

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years, but can turn it over to the other when he begins to go stale. Each instructor might be encouraged to string together field class projects over a period of years in order to amass data for a project of larger scope, because he is less likely to become bored by the repetition of essentially similar experiences if he has something personal to gain from the operation. He can expect to get ideas for his own future research, and might hope to publish articles based on data collected by the students, but he must realize that most data collected by students in their first field experience is so badly flawed that it is not very useful. He will be wise to content himself with the expectation that increasing familiarity with the field area will enable him to develop ideas, questions, and hypotheses for his own future data collection and testing in the area.

The Field Area

There are definite advantages to holding the field course in the same area year after year. The instructor gets to know it well, which reduces the amount of time he must devote each year to his own personal preparation. Each group of students can build on the information acquired by previous groups for studies of change and the impact of new developments. Despite these very real advantages, however, there is also a genuine danger that the course can become ossified if it is repeated too often in the same area. The instructor may lose his verve and enthusiasm, but of greater importance, local informants may become increasingly irritable if they are approached year after year by students, in varying degrees of bewilderment, who keep asking the same questions each time.

The possibility of ossification can be especially critical if the field course is taught on an in-term, on-campus basis (as is actually recommended here), because the field area will largely be determined by the necessity of ready accessibility from the campus, in order to obviate excessive travel time to and fro. It should be quite obvious that ossification is not inevitable, no matter what the field area, but the danger of ossification is so critical that it must be kept constantly in mind when planning field instruction. One of the most insidious features of ossification is the fact that the instructional staff are often the last to become aware of it.

The In-term, On-campus Field Course

The remainder of this chapter is addressed to the in-term, on-campus field course, which, despite the many problems involved, is most likely to prove most feasible for most geography departments. Such a course consists of class sessions for discussion during the week, and field exercises on selected Saturdays. At least two hours a week, preferably in a solid block of time, should be scheduled for class sessions. Caution must be exercised in planning the Saturday field exercises, especially early in the Spring and late in the Fall, because nothing dampens the ardor of a group quite so much as being forced to spend a cold, damp, windy Saturday in the open.

The Role of the Instructor

The instructor must lead the class through a research problem, stage by stage, from start to finish. The students should think about what constitutes a problem in geographical research, formulate the problem on

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which they themselves wish to work, inquire what sorts of data are needed to solve it, collect the data, and prepare a report on their findings. The field course should help the student to see each stage of the research process as a discrete, finite step which leads logically to the next stage.

At the conclusion of each stage the instructor must get the students to think through the question, "What should we do next, and what is the best way to do it?" Although the students need the experience of thinking through the research process one stage at a time, because of their inexperience they are quite likely to flounder around at each stage until the instructor exerts a bit of gentle guidance. After the students have had a suitable amount of time to discuss the various possibilities, he must be prepared to step in and conclude the discussion at each stage by telling the group what they actually are going to do at the next.

The instructor need not be authoritarian about doing this. To begin with, he has the opportunity of guiding discussions and making suggestions at strategic moments. Although each student should have the experience of thinking through, on his own, what the next step ought to be, and of debating this with his peers, the discussions of the student group are often inconclusive, and after fruitless debate the students usually welcome the guidance of experience with some relief. Furthermore, on a very practical note, many of the materials which will be needed in the field, such as aerial photographs, must be ordered well in advance of the time when they will actually be used, and it is the duty of the instructor to ensure that they are available.

Introduction to The Field Area

The first class session should be an introduction to familiarize the students with the field area in which they will be working. An appropriate reading list should be given to them, and all appropriate maps (topographic, land use, geologic, soil, land classification, transportation, building density, social indices, etc., etc., etc.) and aerial photographs should be assembled at a convenient location where the students can consult them at their leisure. For most areas this kind of material is rather fragmentary and confusing, and the instructor should devote the first class session to a discussion of the geography of the field area, preferably with numerous slides.

This analysis should be followed by an initial reconnaissance of the area, as the first Saturday field exercise, so that the students can better visualize the phenomena and patterns which they have been reading about and studying on the maps. In addition to using the field trip to familiarize the students with the field area, the instructor should use it to discover which of them require remedial work in map skills. He should be sure that each student can visualize the landscape from a map, and vice versa, and that each student can follow a route on topographic maps and aerial photographs; those who cannot require special drills.

The General Problem Area

The next few weeks require great adroitness on the part of the instructor, because he must lead the class step by step through the formulation of their problem, the determination of the kinds of data which will be needed to solve it, and the decision as to how these data may be collected most effectively. The first step alone, the formulation of a problem, is so difficult that it is probably desirable to encourage the group to work on a

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single class project, at least initially, rather than permitting each individual student to suffer in his own private purgatory. Individual independent work might play a larger role in the second project, if time permits one.

The second class session should be devoted to the discussion of the general problem area in which the group would like to work. (Here, and at each succeeding stage, the instructor might wish to devote more than a single "class session" to the topic of discussion; he should be wary of cutting off discussion too soon.) To a certain degree this discussion should already have been given some focus by the instructor's introduction to the geography of the area, both during the first class session and on the reconnaissance, and he might even wish to present the group with a list of problems which might be investigated. The morale of the students is higher, however, if at each step they feel that they have had a chance to think through what the next step ought to be.

The students should be urged to keep two considerations in mind as they consider possible general problem areas. The first is the fact that they are in a field course, and they should take the opportunity of selecting a problem that will give them experience in using the three elementary operational techniques of observing, interviewing, and recording (including recording on maps). Secondly, this is one of the times when the desirability of maintaining an empirical-theoretical balance within geography can be emphasized, and the students can be encouraged to relate the smaller segment of reality with which they will be working to the broader theoretical aspects of the discipline.

Selection of a Specific Class Problem

After the general problem area has been selected, the next class session should be devoted to a precise formulation of the problem which will be investigated. Each student should be instructed to think through and prepare his own individual statement of the problem, on the basis of preceding discussions. These statements should be duplicated and circulated to all members of the group in advance of the class session. Each statement, in turn, should be examined critically by the group as a whole, and a final refined statement of the problem should be formulated.

For the next class session each student should prepare, duplicate, and circulate a statement setting forth his own best thinking concerning the kind of information which will be required for the solution of this problem, and the most efficient means of obtaining this information. At this session, as at the preceding one, the instructor must be prepared to conclude the discussion by telling the group what they are actually going to do at the next stage, because student discussion can be inconclusive.

Preparation for Field Data Collection

Even after he has summarized the kind of information which will be required, and the most efficient means for obtaining it, the instructor can encourage individual student thinking by directing the group to prepare for the next class session with the question: "How do we proceed from here?" What base maps will be required, and how might they be obtained? What kinds of data will be entered on the base maps? How should these data be coded for most efficient entry? If interviews are necessary, how will they be structured? If a questionnaire is necessary, what questions should be asked? How should they be phrased, and in what sequence? Each step of the field course provides the instructor with rich opportunities for effective teaching by use of the inquiry method.

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The student group should have thought and argued through each of the steps of a properly designed research project before they are finally prepared to venture forth into the field on their mission of data collection. The responsibility of the instructor is to bring the discussion to a conclusion after a suitable period of debate at each step, and to point the way to the questions which must be answered at the next step. He must also help the students to realize that the actual collection of data (which has been strongly emphasized in traditional field camps) is only a necessary evil in geographic research, and to understand that the geographer in the field is far more than a data collecting automaton. The poor geographer returns from the field with answers only; the good one comes back not only with answers, but with new questions which have been excited by his field experience.

Spring v. Fall

The procedures outlined here, which necessitate a minimum of four weeks preparation before the group is ready to begin data collection, virtually require that the field course be offered during the Spring term in all but the most southerly latitudes, because in the Fall bad weather is likely to have set in just as the group is prepared to take to the field. A Fall term field course has the advantage that the crops may still be in the ground, but student involvement early in the term tends to be mechanical, without any real understanding of why they are doing what they do.

The Research Report

Even though the student project is of limited scope and probably of interest only to a very restricted group of geographers, the students must be made to realize that no research project has been completed until its results have been published and thus are available to the community of interested scholars. The preparation of an analysis of their findings is an essential element of the students' efforts. Apart from the pride of accomplishment in having pushed a research project through to completion and having produced such a report, which can be great, this is another time when the students can be reminded of the empirical-theoretical cycle characteristic of all research. They should be encouraged, as they analyze their data, to formulate new or revised hypotheses which can be taken into the field once again, perhaps by a different group of students, for testing and acceptance, modification, or rejection.

Envoi

The role of field work in geographic instruction has been largely discredited over the last generation, partly because field instruction has been so dreadfully dull, unimaginative, and mechanical. "Field techniques" courses and summer field camps were allowed to become bogged down in trivia. Student time was squandered on learning archaic techniques completely unrelated to contemporary geographic research, and the students were taught how to collect data, without being told why the data were worth collecting.

A field course, to be successful, must lead the students step by step through the research process toward the solution of a single problem, so that they will appreciate the relevance of what they are doing. At each step

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the instructor must make them think for themselves about what ought to be done at the next step, but after their lengthy (and, because of their lack of research experience, probably fruitless) discussion, he must tell them what must be done if the problem is to be solved.

The instructor must impress upon the students the necessity for, and intellectual irrelevance of, primary data collection in geography. The field course should begin to give the student a health skepticism for secondary data, which is a necessary corrective against over-dependence upon such data, but it should also help him to realize that much primary data collection is a tedious chore.

But the field course is a failure if the students are not brought to understand that the geographer collecting primary data need not wear blinkers. High school students can be trained to collect data mechanically; the professional geographer in the field is an observer, a questioner, a scholar who returns to his study with more questions than he had when he departed for the field.

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THE FIELD SEMINAR IN GEOGRAPHY

Introduction

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- Base of Operations

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THE FIELD SEMINAR IN GEOGRAPHY

Neil E. Salisbury
University of Iowa

Introduction

Any justification for the expenditure of time and money required by a field seminar or off-campus field course must lie in what it can offer the geographer today, not in what should be done because it is traditional. This chapter focusses upon a compromise solution, a compromise dictated by the pressures of alternative uses of the scarce resources of time and money, coupled with the realization that there are great advantages to be gained from an exposure to the real world beyond the library and laboratory.

There are at least five reasons for devoting time and effort to a field seminar. Three of these may be partially approached by an in-term field course (which many geographers would feel has little justification unless it is to prepare students to conduct field research on their own). The fourth, which cannot, will be considered first:

1) Variety. Breadth of research experience is a product of facing different situations, whatever the format and techniques employed. The locale of the in-term field course can only be the campus and perhaps a fifty mile radius around it, and exotic environments can be used only when at least several days are available. It is very difficult, for example, to examine the effects of alpine glaciation in eastern Iowa. Different environments not only will raise different questions about the problems that were worked on in the in-term course, but a whole new spectrum of problems may be opened up for consideration.

2) Intensity. The field seminar is a period of concerted effort to achieve a goal, a "crash program," so to speak, whereas an in-term field course must take its place alongside the lectures and laboratory sessions of other courses, introducing a choppiness into the learning process. Although individual field days may be used to advantage to introduce a problem to a student's attention, enormous frustrations may arise from having to drop the subject at the day's end. Just as he begins to get some glimmer about how to proceed with the task, he must drop everything for a week and return to other matters. Blocks of time in which to do research have been described as the most precious gift a university can award a professor. The field seminar affords a similar opportunity to the student engaged in attempts to formulate some order out of a seemingly chaotic landscape. The elimination of distractions provides him with an opportunity for continuous exposure to a problem and complete immersion in its solution.

3) Insight. Very much like any field research, the field seminar is an experience that prompts one to ask questions that might not otherwise have been considered. There is a great deal to be said for the experience of collecting one's own data from scratch, without relying solely upon columns of numbers in a census volume or contour lines drawn by photogrammetric machines. Published census and other data have limitations which may never be fully appreciated until the geographer has in some small way come to grips with the problem of collecting similar data. He may never sense the fuzziness of the boundaries of the real city as opposed to political city limits. Only his personal interviewing experiences will reveal the perversity of many respondents, or their glib vagueness when answering questions pertaining to their social activities or to their roles as decision

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makers in the economic process. The geographer will never appreciate the micro-variations of topography, the things maps don't show, until he has sloshed his way up a stream or poked through a thorny bramble to discover the relationships for himself.

It is true, of course, that some understanding of all these situations may be gained in the in-term field course, but the activities in such a course are limited, to a considerable degree, both by the logistics and organization of the course, and by the professor's philosophy of teaching. The student may panic momentarily when he is faced with the necessity of creating a tangible and definitive packet of research on his own, but he will eventually be forced to make his own decisions about what kinds of data to collect, how much he has time to collect, and where to collect it. And field experience is like any other research. One learns by doing.

4) Rapport. The esprit de corps which the field group gains from a common experience, although perhaps the least important advantage of the field seminar from a pedagogical point of view, may well be the most important to the operation of a graduate program and to the acquisition of professional proficiency by the young geographer. All members of the seminar face common problems in the organization of their research and in the difficulties of carrying out their projects. Living with a group of individuals who all face the same spectre produces a bond that may last a lifetime. The group that attended a certain seminar will have shared certain experiences that makes all others outsiders. The insights gained from living and working intimately with other people can help one to accept their limitations, and to appreciate their individual and perhaps hitherto unsuspected qualities. The fragmented campus schedule provides no similar opportunity of quite the same order.

5) Ideas. There is a widespread, but largely fallacious, belief that faculty members use students in field courses to collect data which the faculty member later publishes; with the inevitable exceptions, field data collected by students must be used with such caution that the faculty member is better off collecting his own data from scratch. And the demands of students are so heavy that he cannot expect to have more than a day or so a week for his own work when he is directing a field seminar. On the plus side, the field seminar does provide him with an opportunity to become better acquainted with an area in which he may wish to do future field research, and to begin to develop ideas and hypotheses for future testing in the area; students may contribute to the latter.

The Nature of the Field Seminar

Level of Instruction

The field seminar is a second or advanced level field experience which presupposes an introductory field course such as the one described in the third chapter. Regardless of the format to be followed, precious little time is available to instruct the student in the mechanics of data collection, sampling, use of instruments (for those working on problems in physical geography), or interviewing. In actual fact, some remedial training is almost always required, because students often join the seminar from diverse backgrounds, and it is rare if they all have become familiar with each and every technique or instrument they may need to use. To start from scratch, however, with completely inexperienced students, would defeat the very purpose of the seminar.

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Although the seminar described here is designed for graduate students, there is no reason why it could not serve as a senior honors course where an undergraduate major program would permit. The increasing popularity in liberal arts education of the "third term," or "middle term," a break between semesters which is devoted to individual projects, suggests real possibilities for the incorporation of some of the ideas presented here into the undergraduate curriculum. Unfortunately, most middle terms occur in the dead of winter, and the nature of the problems which can be investigated will be severely constrained unless the school is located in a non-snowy climate, or unless the long trek to the sun is feasible.

Length of Time

One explanation advanced for the declining popularity of the traditional field camp in geography, which was often six to eight weeks long, is this very considerable investment of time. The field seminar represents a compromise between the need for a continuous block of time devoted to field research and the pressures against the longer session.

A three week period is considered optimal. Any shorter session would not provide many more field days for data collection than an in-term field course. Longer sessions may develop problems of staleness or deteriorating efficiency on the part of both student and professor, and close contact between large numbers of people may eventually strain the good feeling and esprit that the group has developed. The professor may seek frantic escape from the full time task of pontification. Student reactions will vary. Some will be sorry that there wasn't just one more day or two to visit another stream or a few more farms, but others will feel oppressed, as though the seminar is a jail sentence to be endured rather than enjoyed. The latter feeling probably is in direct proportion to the degree of coercion involved in their presence at the seminar. Some professors, and indeed many departments, require a certain amount of field experience that the student may never come to understand or appreciate.

The three week period seems to provide a balance between participant interest and what can be accomplished, and it has the further advantage of being practicable. Few students indeed cannot budget enough funds for such a short period, and three weeks fits nicely into minor breaks in the tight schedule of an academic year, summer sessions, and family vacations. Less resistance is advanced by the student, the professor's research schedule, the college administrator, and the various affected families, than would be the case with a longer session.

Base of Operations

There are two schools of thought concerning facilities for an off-campus field camp or seminar. One espouses the use of a permanent station, probably year after year; the other prefers a shifting base of operations, using permanent structures if available, but camping facilities where more convenient. There are strong arguments on both sides.

Permanent facilities can often be found at such places as biological field stations and other research laboratories. These generally have the advantage of comfortable accomodations, including a mess hall and a laboratory for map and other work in the evenings or during foul weather. Repeated use of the same field area, moreover, permits the professor to gain experience with the region, and shortens the time he must devote each year

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to his personal orientation and preparation for the field seminar. At the same time, however, overfamiliarity can breed contempt, or at least staleness, and the local inhabitants may react increasingly negatively to the annual invasion of students clutching questionnaire sheets.

Shifting the base of operations from year to year eliminates the problem of overfamiliarity and staleness, but it imposes far greater responsibilities on the professor, because he must prepare anew for each seminar; if his heart is not in his work, the burden of time lost from other duties is intolerable.

A shifting base does not preclude utilization of permanent facilities. Many schools have dormitories and other facilities which are not used during the break between summer session and the fall opening of classes, making this a particularly desirable time of year in which to conduct a field seminar. In some instances motel or hotel facilities may be arranged at modest cost.

A shifting base also permits excursions into high mountain or other geographically remote terrain, with tent camping the order of the day. Tent camping provides an especially flexible base for the field seminar with an orientation toward physical geography. Drawbacks of the tent camp include the difficulty of keeping warm and dry during periods of foul weather, the lack of lab facilities, and generally poor lighting, which restricts the burning of midnight oil.

The Format of the Field Seminar

Three different doctrines of instruction have been used in field seminars. One of these should more properly be called a "pro-seminar," although the common topic of discussion is what is perceived in the field, rather than a common list of readings as in a campus-based proseminar. The second is a research seminar in which the entire group does research on a common problem. In the third individual research topics are investigated, with as much interchange of ideas and discussion as time and common interests permit.

The Proseminar

At first glance this may seem to be little more than a well-directed field excursion. The student spends most of his time with the group, examining a common problem with the professor, observing relationships, and coming up with questions for discussion, rather than collecting data which he himself must interpret. This format makes the professor's viewpoint paramount. His interests and the manner in which he conducts his field research will be critical. A student's appreciation and response, as well as what he learns from the experience, will be in direct proportion to his understanding of and empathy for the professor's goals. The perceptive student, particularly one who has worked with the professor previously and has some notion of the direction his thinking takes, and who has a substantive or theoretical background in the subject involved, can gain much from a field proseminar. It can provide a rich experience in perceiving a host of impressions of the landscape, utilizing all of the senses—sight, smell, sound, and perhaps touch—which combine to form a deeper appreciation of the land and the men who inhabit it.

In rare circumstances a student from some other institution or background may embrace the subject with delight. "This," he says, "is what I

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have really been interested in all along." More commonly, however, kindred souls are to be found only among those students who have had some previous opportunity to be drawn into the professor's appreciation of his subject. The mediocre or unperceptive student, or one who lacks a substantive background in the field of inquiry or experience with the professor, may gain little. Although he may follow the procedures and discussion mechanically, he may never truly appreciate why he does what he does and what he is instructed to do. If the proseminar format is used, there is a strong argument for prior student experience with the professor, and not just in a field course, but in his subject matter specialty, in order to provide some basis for understanding just what he is trying to do.

The proseminar approach is perhaps more successful with those who study culture than with those who restrict their view to the cold facts of an economy or the shin-breaking rocks of the physical landscape. Impressions are important, and the conclusions and generalizations that are made require skill and a subtlety that is not gained overnight or in a few lectures. The "practical, hard-headed" person may be repelled by this approach, wondering why grown men waste their precious time in such indulgences, but this may be because his eyes have not been opened fully to the values that can be gained from the field experience; in a word, new ideas.

One of the principal reasons for going into the field in connection with any problem is to discover questions whose existence would not otherwise have been suspected. Relationships may be observed in the field that could never have been perceived on maps and aerial photographs, or from columns of secondary data. Hypotheses may be suggested, as well as ways of treating data which may be collected during some more formal phase of study, perhaps at a future date. And problems of sampling data to solve a particular problem should be much clearer than if a test area had never been visited. Those who demand more order or concrete results from their field experience should direct their attention to the team or individual seminar approaches. But the proseminar approach has applicability even there, during the orientation and reconnaissance period.

The Team Research Seminar

The team research format may be best when a large proportion of the students in the field seminar have an inadequate background for the kinds of problems that appeal to the professor. With this format the student observes how the research scholar goes about his task in the field, and participates to the degree that he is capable. For example, students are rarely familiar with all the necessary techniques of data collection, especially in physical geography, where a variety of instruments may be used. Consequently, it may be in order to teach some techniques, and to fill gaps in the students' substantive background.

Research on a common problem is especially well adapted to such a situation. As in the proseminar, the professor's interests are paramount, and he will probably choose the problem and the methods to be employed in examining it and in collecting data for its solution. Unlike the proseminar, however, observations and interviews are made and recorded according to some specific plan and with some systematic sampling procedure. In short, the students participate in all levels of research related to the solution of a particular problem. The skill with which the professor elicits suggestions as to alternative approaches, or possible hypotheses, may very well determine the extent to which the students will feel that the

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research is in some way their own, and not simply an exercise in which they are merely filling in the blanks. But in the final analysis decisions must be made, and the professor is responsible for a balance between the seminar as a teaching device and as a source of data on a subject suggested by his own interests.

All students in the seminar may not be employed in all aspects of data collection, because responsibilities will vary to capitalize on individual skills, interests, aptitudes, and personalities. The purpose of the seminar is to gain research experience, and learning how to do things right by having had the experience of having done them wrong may be the most valuable product of any given trial. The individual student, however, may find the team research seminar merely an assembly line job, in which he performs the same monotonous activity repeatedly. Although the continuity provided by day-to-day exposure to a problem ought to be able to help students develop far beyond the possibilities of an in-term field course, the individual student may achieve mechanical success and intellectual failure.

Individual Research Seminar

Individual research problems should be undertaken if students in the seminar are well prepared, both in their subject matter fields and in field experience. The student benefits from the continual interchange of ideas with his peers and the professor in the field, just as he does in an on-campus seminar. The professor can supervise several student research problems simultaneously, a much more efficient use of his time than if the same number of students were engaged in individual research efforts scattered far and wide away from the campus. Moreover, although the research problems are individual ones, some commonality of purpose may well be introduced, if for no other reason than by the constraints of the limited environment of the seminar locale.

The student himself should choose the problem he will work on. Some will need more guidance than others, for just as student imagination varies, so will their appreciation of the scope and nature of a problem that can be handled in a field site within a limited time period. The professor's judgment and experience are vital here. The problem selected by the student may well serve as the basis for a more complex and elaborate problem that can be used as a dissertation or thesis topic, or the seminar period alone may prove sufficient for the collection of data for a master's thesis. Alternatively, the student might choose a problem deliberately tangential to his main interests as a means of providing breadth of experience. This might enable him to examine pertinent variables within an environment differing appreciably from his thesis area, or to examine a different set of variables. In any case, the field seminar is not too different from any other seminar, apart from the difficulties imposed by lack of library and computer facilities, and the pressure of limited time.

The Organization of the Field Seminar

Size

The proseminar, like the field trip, is limited in number of participants only by the size of the vehicle which is used, but the individual research seminar, at the other extreme, has a maximum of three to six

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students per faculty member for effective operation. Although this is expensive, it is an essential investment for any department which pretends to offer a doctoral program in geography.

The different interests of the students in an individual research seminar also impose unusual transportation requirements. Experience has shown that unless there is at least one vehicle for every two students, the faculty member is pressed into service as a taxi driver for the entire field group.

Preparation

A field research seminar ideally would involve two faculty members, one a physical geographer and the other a human geographer, so that students would learn different approaches and viewpoints, and would gain insight into problems of a type to which their own specialized interests might not otherwise lead them. The attempt to offer a variety of activities during a single summer seminar involves careful preparation and planning, because research in physical geography often focuses on a limited area with detailed, almost microscopic, collection of data, whereas problems in human geography may involve a considerable amount of travelling about the countryside. Logistical problems may result where two disparate scales of analysis are involved in a single seminar.

The preparation period may consist of only two or three days on campus before the trip to the field area if participating students are from a variety of campuses and are not familiar with the faculty member directing the seminar. If most, or all, of the students are from the professor's own institution, the preparation period may extend over the entire preceding term, which permits the three week field period to be devoted wholly to the problem. In either case, the preparation period should bring all parties to a common understanding of what is to be attempted in the field. Study of maps and air photos, preparation of interview sheets, decisions on methods of operation, selection of sample sites and areas, preparation and reproduction of base maps, and familiarization with the field seminar locale—all must be accomplished during the preparation period.

The conflict between the impressionistic, field experience school of thought and mechanistic, data collection types should be faced during the preparation period. Before arriving in the field locality the latter may have already rigidly outlined a problem which permits little variation in the selection of new hypotheses or new questions, or even for new variables which the first few days' experience might suggest. If detailed questionnaires are to be used, for example, duplicating facilities may be lacking at the field site, and questionnaire revision may be difficult to impossible. Similar difficulties may beset the instrument or photo-based study, because space limitations will prohibit carrying all possible instruments into the field. Early work in the field seminar may reveal the inadequacy of pre-selected sample areas, but the study may be restricted to less suitable areas of observation nonetheless if aerial photographs are used as base maps, because they take up to two months to acquire.

Impressionistic field experience oriented study does not suffer from these constraints, and those engaged in this kind of work can modify their activities and goals rather easily as the situation requires. Data collectors may resent such a loosely organized undertaking, and part of the preparation period should be devoted to discussion of the problems involved in these

disparate approaches, so that adherents of each will understand the difficulties and limitations of the other, because the objective is an intellectual blending of both, not a resolution into opposing camps within the seminar.

Travel to the Field Seminar Site

If all members of the seminar travel together from the campus to the field site, the caravan of automobiles might use the trip to examine gradients of change in the landscape along the route. Perhaps some especially interesting natural or historical sites might be visited. Above all, the seminar members should focus their attention on the nature of the problem to be considered, and the landscape along the route should be used to raise questions which will require consideration in the field investigation.

Reconnaissance within the Field Seminar Area

One day, perhaps two, is used for a detailed reconnaissance of the field seminar locale to give all participants some idea of the general lie of the land in the area where research is to be conducted. This is especially useful for students who are about to embark upon individual research projects, for it gives them the opportunity of discussing with their peers the nature of their problem and the manner in which they intend to approach it. This may well be the last time that all students are formally gathered together until the end of the seminar. Furthermore, the reconnaissance of a broader area than the isolated sample sites where subsequent research will be concentrated helps place these sites in a more general context. The reconnsissance may reveal relationships between factors or variables pertinent to the proposed research that might not otherwise have been clear, and additional hypotheses may be suggested.

Conduct of Research

The conduct of the field seminar after the initial reconnaissance depends upon the format chosen by the professor in charge. If a proseminar or team research approach is to be used, the group will proceed as their plans and skills permit and the professor's philosophy dictates. The student working on an individual problem will formulate or reformulate his statement of problem, and will proceed to execute his plan after discussion with his peers and seminar leader. A continuous exchange of ideas will suggest alternative solutions or lines of approach to him. Give-and-take discussion' around a compfire or in the lab should be one of the most useful aspects of the field seminar; in fact, this may be considered a principal reason for going into the field as a group rather than as individuals. When a student's research problem is known to his fellows, their experiences in other parts of the field area may turn up useful leads, either sites to be investigated or ideas on procedures.

Preliminary Reports in the Field

It is useful to devote the last day or two in the field to preliminary reports and discussion of findings. Although it is too late to collect additional data, the presentation of preliminary findings in the landscape that generated the research and served as the source of data lends an air of authority and clarity to the student's presentation. If some aspect of his

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report is not clear, he has been served notice that something requires further work before it can be included in his final report. Often, too, new ways of data manipulation may be suggested.

The trip back to compus might hope to copy the procedure of the trip to the field site along a different route, i. e., visiting selected points of interest, and considering varying landscapes along the traverse. In practice, regrettably, it is difficult to curb severe attacks of "barn fever" after an absence of three weeks, and the malady strikes at a distance of 500 or even 1,000 miles.

Final Preparation of Written Reports

After returning to his home campus the student analyses the data he has collected, makes laboratory tests or statistical manipulations if appropriate, perhaps visits the library to brush up on some theory or facts he may not have had too well in hand when he was in the field, prepares illustrative material (maps, graphs, development and printing of photographs), and writes his report much as he would prepare any other piece of research. Several weeks may be allotted for this task. The final report should be duplicated so that all members of the seminar may have their own copies. This is especially useful to the faculty member, who may wish to return to the field area with a future seminar group. The reports of one group often serve as grist for the imagination of future students.

A final note for the future. If the field site shifts to another location the following year, many students may be encouraged to attend another session. One good session whets appetites for another, and many good students plan ahead with delight for the following year's field seminar.

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APPENDIX A

ON FIELD TRIPS IN GEOGRAPHY

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APPENDIX A

ON FIELD TRIPS IN GEOGRAPHY

Peirce F. Lewis
The Pennsylvania State University

Introduction

Field trips are among the most used and misused devices in the arsenal of geographic education. A good field trip can be a superb experience for all concerned—achieving a rarely-reached pinnacle of intellectual excellence. At its worst, a field trip can be a waste of time and a bore—paralyzing to the mind and calculated to kill any student's potential enthusiasm for geography. Any competent geography teacher can run a good field trip, provided that he pays attention to some simple rules of the game. The payoffs are enormous. It is useful, therefore, to consider what makes a good field trip and what makes a bad one.

Why field trips?

Some parents, many teachers, and nearly all administrators can occasionally be heard asking this question. Field trips, after all, are expensive—not only because vehicles have to be rented or gasoline bought, but because a field trip takes teachers out of their classrooms and disrupts students' schedules. "Why field trips?," therefore, is not an idle question, and it deserves a serious answer.

In fact, there are several answers. First, and most obvious, the field is the geographer's laboratory, a place where facts are collected and observations are recorded in order to test the truth or falsity of some general idea or law. Some field trips are simply an introduction to that laboratory. Taking a student of urban geography into the streets of a town to record variations in the number and function of retail establishments, in turn to evaluate the validity of central-place theories, is analogous to asking a physics student to rediscover Boyle's Law by measuring changes in temperature and pressure in a closed cylinder. It is like having a geology student make an alluvial fan with a hose and a pile of sand to measure the relationship between the velocity and gradient of a stream. Like any laboratory, the field to a geographer is a place to gather data which can be obtained nowhere else.

But to a geography teacher, the field is more than a place to collect facts. The field is the only place where students can be shown what was only talked about in the classroom. It is one thing, for example, to talk about how different kinds of bedrock produce different kinds of soil, which in turn induce differences in agricultural productivity, which are finally related to differences in standard of living. It is quite another thing to show a student a fat limestone farmland, and then show him an adjacent region of shale—a tortured land of steep slopes, eroded soil, twisting roads, and abandoned farms. Teachers can lecture endlessly about concentric rings of land use which develop around the central business districts of cities, but it is quite another matter to let the student see the ring of down-at-the-heels districts which isolate and strangle the city's core. Quite simply, a field trip is a unique opportunity to dramatize and reinforce learning.

A good field trip has a third enormous virtue: it can provoke students to ask questions which are unlikely to arise in the classroom. Indoors, the

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teacher may tell students that limestone tends to make better soil than shale. The fact is, of course, that this generalization—like most that we dispense—is often true, but not always. The student who is properly led through a limestone region cannot help but note the exceptions—and wonder why they exist. Again, a field trip which follows a well-planned cross-section through an American city can easily demonstrate concentric rings of land-use, but it can also demonstrate important irregularities in the rings. What induces these irregularities? Does the original generalization really hold, or must it be modified? How? In short, a good field trip can teach a student to look at the world with new eyes—perhaps to make him truly see for the first time.

There is a fourth reason for field trips. The best ones are peculiarly suited to breed ideas and stimulate imagination—to create an atmosphere conducive to those serendipitous deductive leaps which occur when the mind and senses are working simultaneously and at full pitch. In an earlier and simpler time, such insights would have been taken for granted at camp meetings, where sudden flashes of intuition were seen as callings from the Lord. The number of students whose souls have been saved by field trips is limited, I suspect, but considerable experience satisfies me that the deductive leap, without which no creative or original thinking is possible, occurs far oftener in the field (or, at least, after field work has taken place) than in classroom or even laboratory. I am no psychologist, and I can only guess why field trips are so peculiarly effective in stimulating geographic insights, whereas the formal classroom is relatively barren. It is, I think, largely a difference of environment. In the classroom the teacher selects facts and hopes to derive generalizations from these selected facts. Try as he may to give his material the breath of life, the teacher is still prisoner of a numbered classroom, a milieu of blackboards, audio-visual aids, and mass-produced desks anchored in rows and files to the floor. Ideas, like the classroom itself, are disembodied and encapsulated. The field, however, is another story. Sensations crowd in at a fantastic rate and in no special order, battering the student's sense with barrage of sights, sounds, touches, and smells. Even the form of single objects maintains no constant substance, but changes from moment to moment depending on the chance nuance of light or breeze. To a sensitive student on a well-run field trip, the sheer volume of sensation is overwhelming, and I have seen such students literally beaten groggy by this constant pounding of stimulus upon stimulus. The effect is similar to religious conversion—difficult to describe accurately, unmistakable in effect, and hopefully beneficial in the long run.

The fifth and final reason is the best, and if field trips had no other justification, it would be enough. Field experience can teach a student that a landscape is not merely a collection of fragmentary visual images, but rather a system of interrelated parts—that this system is logical, comprehensible, and controllable—if only we have the eyes to see, and the wit to understand. It is a sorry fact that Americans do not understand their native landscape, and because they do not understand it, they have lost control of it. Ugliness, chaos, and blight are the results, which all of us must live with to our sorrow and our shame. If our ravaged towns and countrysides are to be brought under control, we need competent citizens who know how to do the job—but they cannot do it if they do not understand the processes which produce landscapes. It is precisely this—how landscapes evolve—that a good field trip in geography is superbly designed to teach.

I am not arguing, of course, that field trips are the panacea for all

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our civic woes, but I do suggest that good geographic field training can help future citizens understand what has made the face of America what has made the face of America what it is, and thus to understand how it may be made better than it is.

In simple terms, a good field trip is an efficient and often exhilarating way to teach. Those who question this proposition (and there are many who do) probably have never been on a good field trip. This situation, however, is scarcely surprising, since really first-rate trips are rare while wretched ones are dismally common. The main purpose of this essay is to help increase the number of good trips and reduce the number of bad by suggesting what mades a good trip, and some pitfalls to avoid.

Two Misconceptions

Two commonly held ideas have stymied many field trips before they have ever gotten onto the ground. One is that field trips cannot be effective unless they are elaborate and expensive—the other that a field trip must visit exotic places to be truly exciting. Both ideas are dead wrong.

A good field trip can be long or short, elaborate or simple, ruinously expensive, or cost nothing at all. A walk around the block in the company of a teacher who knows what to look for can be an intellectual delight, while a transcontinental journey can be a disaster if ineptly led. A good field trip is good regardless of length or cost, but it will be good only if the leader of the trip knows what he wants to do and how to go about doing it.

Nor is it necessary to visit exotic places. Indeed, the principles of geography—that is, generalizations which hold true under a wide variety or geographic conditions—should be discernable in the most mundane settings. Obviously, then, an hour's walk through a familiar suburban neighborhood may be more useful in teaching geographic principles than weekend excursions to Niagara Falls, the Senate in Washington, and other natural wonders.[1] We all know the feeling of let-down when we see some much-touted place for the first time, only to find it less than expected. Too seldom, however, do we experience the reverse—the unexpected delight that the laws of nature work in our own back yards, just as in Timbuctu or Yellowstone.

The Do's and the Don'ts

The key to a good field trip—as in any teaching—is preparation. To simplify the following discussion, it will be useful to consider (1) intellectual preparation—both of the instructor and the student—as separate from (2) mechanical preparations such as arranging for vehicles, visual aids, meals, and the like. The first is overwhelmingly more important than the second, and it is possible (though unlikely) for a trip to be resoundingly successful even if mechanical arrangements are botched. The converse is not true, for a smoothly run trip, replete with modern buses and frequent rest stops, can be and too often is an intellectual catastrophe.

1. There is nothing immoral about taking students to see strange and wonderful places, and no teacher needs feel guilty about enjoying the Golden Gate Bridge or cobras at the zoo. One should not, however, confuse a field trip in geography with picnics, outings, or senior class excursions.

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Intellectual Preparation

Preliminary homework

The most common reason why field trips fail is that neither the leader nor the participants know enough about the subject matter to be studied or the area to be visited. Many students (and too many teachers) have the idea that going on a field trip means riding a bus around the countryside, and somehow absorbing knowledge and perhaps virtue, by osmosis. This is nonsense, of course. A field trip is not just a pleasant excursion; it is a device for learning things, and one does not learn without knowing how to ask the right questions. On a field trip, as everywhere else, the people who ask those "right questions" are those who have done their homework and know their subject as a result. The need for advance homework applies to the leader and the participants alike.

What sorts of homework? Take the example of the trip already mentioned—to study the relationship between soils, agricultural yields, and living standards in limestone versus shale areas. Before students go on such a field trip, they should know the mechanical and chemical differences between these two rocks; they should know how each originates; and they should know why the two rocks break down differently when weathered. They should know something about how soils are formed, and what constitutes a "good agricultural soil." They should be acquainted with the different field crops which are grown in the area to be visited, their relative market values, and how they are used. Most of this can (and should) be taught in the classroom, well in advance of the field trip. Field trips, after all, are costly, and field time should not be wasted doing what could just as well be done indoors.

I am not arguing that the students should be modeled into experts on geology, soil science, or agronomy, much less into junior versions of Leonardo da Vinci. If the job of preliminary teaching is well done, however, the student will go into the field knowing what to look for—equipped to ask reasonable questions and discover things for himself. Such discovery in the field can come at any number of levels—factual, conceptual, or even moral: everything from "Is this wheat? It's just another grass.", to "Look at this soil—no wonder people can't make a living here!" up to "This is terrible...we can't let people go on living this way!" Each kind of discovery is valuable, because it opens the student's mind at the same time it opens his eyes, but each is more likely to occur if the student has done his homework in advance.

Planning the trip

A good field trip is an art form, and consequently has much in common with a good lecture, essay, short story, or novel. In the first place, the best of each revolves around ideas, not just facts or things. Second, the best are carefully organized, with introductions, central bodies, and conclusions—or, at least, summaries. Finally, each goes from simple to complex ideas. Careful planning is essential if these principles are to be put into effect. Again, take the example of the trip to contrasting areas of limestone and shale.

The central idea

It would be possible, of course, to take a trip to a shale pit and a limestone quarry, to see what the rocks look like, to teach the students

to identify them, and to observe the process of rock quarrying. Such a trip, mainly concerned with noting facts about rocks and quarries, would doubtless be a pleasant relief from classroom routine, and it might even be interesting, but it is scarcely designed to exercise the student's brain.[2]

The same basic raw material, however—rocks and quarries—can be put into a context of ideas and made both fascinating and intellectually challenging. Consider: (a) why in our area does limestone occur here and the shale there? This central problem would require the reading and interpretation of geologic maps (a provocative matter in itself) and would provoke the class to think about some of the ways that rocks vary from place to place—that is, into some of the central problems of physical geography and geology. Or, (b) ignoring the geology and accepting the fact that the rocks are different, what are the results of the difference? Such a question, of course, leads directly to other questions about soils and farming, and automatically leads the students from the quarries to the fields, where still more questions must be asked about soils and farming. Or (c) why are the quarries here? With limestone all about, why dig here? The answer may be geological, but as often lies in other directions. How is limestone used? Why? And where? Why there? Such a line of questioning raises the problems in industrial geography and factory location, and it might even be profitable to follow railroad tracks to the nearby steel mill where the lime is used as flux. But, did the location of the quarry determine the location of the mill, or vice versa? Such a question, of course, cannot be answered by field observations alone, no matter how intelligent they are. New facts and new insights are needed, and the curious student will hopefully wind up in the school library, trying to find answers to some of geography's most basic questions.

The logical organization of an itinerary

These examples suggest that this "central idea" of a field trip can best be phrased in the form of a question, or series of questions. How these questions are answered will determine the itinerary of the field trip. If one seeks to understand the relationship between rocks, soils, and agriculture, there are several logical ways to unravel the relationship. It might be, for example, that the teacher would begin at the quarry, where the rocks are best exposed, then move to a newly-dug ditch to see a soil profile, next to the fields where that soil is being cultivated, and finally to the farmstead to talk with the men who run the farm. This sequence is not inflexible, of course, for the teacher might well start at the farm and trace the chain of logic backward, asking next about soil quality, and finally about the rocks which produced that soil.

However the teacher chooses to arrange it, the logic must always be there, and the itinerary must reflect that logic clearly and rigorously. It is always a temptation to visit an interesting place "because it is nearby." even though it is out of logical order. Such a tactic should be rejected if it threatens the logic of the trip, for when logic breaks down, confusion

2. Such is the classic "trip to the dairy," which has masqueraded as a field trip in geography for too long in too many schools. Without any idea of why they are going, students are herded into buses and taken to see the cows, milking machines, centrifuges, and bottling machines. The students don't mind, because bus rides offer a pleasant break in routine, and besides, bottling machines are interesting. For cranial stimulation, however, a prefrontal lobotomy might be preferable.

results—and a busload of confused students is a prospect which no experienced teacher relishes.[3]

This is not to say, of course, that the teacher must adhere fanatically to a prearranged scheme. The most interesting things on a trip often occur unpredictably, and a teacher would be foolish to ignore them, simply because they do not "fit in" with advance plans, or with the central idea of the trip. If something interesting is spotted, there is no reason to avert the eyes or avoid talking about it. On field trips, as in classrooms, the best learning is often accidental, and the wise teacher will alow for such happy accidents by building a cushion of "extra" time into the itinerary. A good field trip is seldom grim.

From the simple to the complex

The idea of starting a field trip with simple ideas and progressing to more complicated ones is so obvious that it may seem unnecessary to mention. Unfortunately, it is often difficult to arrange an itinerary in such a way, for the world is disorderly, and not designed for the convenience of field trip leaders. Usually it is necessary to make special efforts to find places which lend themselves to simple or at least general beginnings.

One efficient way of doing this is to find a high place which overlooks the area of the trip, and from which the teacher may deliver an introductory "lecturette" about the theme of the trip and, if possible, to delineate the itinerary. In the country it is sometimes possible to find a hilltop, mountainside, or firetower where this "big picture" may be sketched. In large cities, high buildings often have observation towers from which the class may look down on the area to be visited before getting involved in it. Where such places cannot be found, the teacher may substitute maps for reality, sketching the itinerary of the trip, and giving the students a chance to ask general questions before getting immersed in detail.

Keeping the Students Informed

However the teacher does it, he must make the students understand two things clearly: (1) the purpose of the trip (i. e., the "idea" behind it), and (2) the itinerary of the trip, and why it was laid out that way. If they do not understand these things, they will be lost—intellectually, geographically, or both—and either is bad, for a lost student will simply stop paying attention. All teachers know how easy it is to lose students in the classroom. It is much easier to lose a student on a field trip—in unfamiliar surroundings, with a host of miscellany vieing to distract his attention. Energetic steps are necessary to prevent this.

Before the trip

At least one "prep session" should be held in the classroom before the trip. The purpose of this session is to delineate the itinerary, and to reiterate the logic of the trip. For this session, each student needs (at the very minimum) a map on which the route is marked and stops are indicated.

3. The logic of a trip may demand that the itinerary double back on its tracks from time to time. This may seem inefficient, but in fact it is not. Understanding—not covering mileage—is the purpose of a field trip. And if understanding cannot be had without extra mileage, so be it.

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This may be nothing more than a two-color dittoed sketch map, but it should be detailed enough to allow the student to follow the route easily. If possible, each student (or pair of students) should also have a high quality published map on which he can locate the itinerary. Depending on the theme of the trip, the map might be a geologic map, a soils map, a topographic map, or simply an ordinary city street map, such as oil companies dispense at gas stations. Using these maps for reference, the teacher should carefully "lead" the students through the itinerary, so that they understand clearly where they are going, and why.

It is not difficult to catch and hold the students' attention in such a prep-session. They are inclined to be interested anyway, simply because unfamiliar maps are inherently interesting, and because the students know that they are going to visit the area which the map portrays. Furthermore, if the teacher does his job properly, the students can be induced to speculate on what they might see at certain places on the trip, using the map as the basis for the speculation, and can even provoke vigorous argument about the meaning of various patterns on the map. Such arguments, of course, need not be resolved in the prep-session—and usually should not be—for the student's anticipation of going into the field is heightened by knowing that answers to interesting questions await him there.

A good teacher can carry this one step farther, by encouraging the students to help in planning the itinerary of the trip. There are several virtues to such an approach—the student develops a sense of personal involvement which he might not on a trip where he is led from place to place like a leashed puppy. When a student helps plan a trip, it becomes his trip, and not just the teacher's. With this sense of involvement, the student can often be induced to read books or articles, and to examine maps before the trip in order to lay out an intelligent itinerary. (To a degree, a student who helps plan an itinerary is on the spot with his fellows, and usually will not want to appear stupid by leading his cohorts to stupid places.)

Ultimately, if the students are sufficiently mature, the main responsibility for planning the itinerary can be turned over to the student, with the teacher standing by to help and guide where necessary—and, of course, to make sure that the students in their enthusiasm do not wander too far away from the central idea of the trip. Such responsibility cannot be delegated to inexperienced students, however, since most students have never been on a really good field trip, and have not the foggiest idea of how to go about planning one. To help break them in, however, without ruining the trip, a careful teacher can designate special places along the route, or small segments of the route, and ask individual students (or groups of students) to take over the discussion when the trip arrives at those places. Such discussions can be treated like a classroom report or term paper if the teacher wishes—although grading the student for his performance often takes much of the pleasure out of it. If the student is any good, simple self-respect and a desire to show up will in front of his fellows will be ample incentive for him to do the best job he can. It is, of course, imperative that the student has access to whatever he needs in books, maps, or special materials to help him prepare his report, and whatever visual aids he thinks he may need in the field.

My own experience in running field trips has proven that considerable enthusiasm is generated by turning over part of the planning function to students. A good friend of mine—and a successful teacher—adds the following:

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From the practical standpoint, you must remember that students about to depart on a geographic field trip have already been on numerous other field trips, all of which were BAD, and none of which they helped to organize. Thus, even with careful teacher planning, the students will start the trip with negative attitudes. On the other hand, should they help to plan the geographic trip, they will start with the attitude that this trip is different from their prior experiences.[4]

During the trip

If the preliminary planning has been done properly, a field trip will almost run itself. But there is one additional inflexible rule to running a good field trip. It is this: ALL STUDENTS MUST KNOW WHERE THEY ARE, ALL THE TIME. The reasons for this dictum are as compelling as they are simple: a lost student is confused, at best, and at worst, bored; neither situation is likely to produce much learning. (Nothing is more frustrating for a student than watching through a bus window while an unidentified landscape passes in fleeting fragmentary images before his uncomprehending eyes.) Conversely, following the route carefully on a map will inevitably help students learn to read maps more effectively and easily, and keep their attention focused on the business of the trip. Finally, on a field trip in geography, where location and the relationship between locations are of constant concern, students can scarcely ask very intelligent questions about location if they are unaware of their own.

The resourceful teacher can think of various ways to make sure that the students can locate themselves accurately at any time. One can, of course, simply order the students to find their location on the map, but this tactic wears thin in short order. A simple but excellent technique is to ask students to identify visible landscape patterns and to relate such patterns to the map—in the country, the relationship between a side road, a ridge, and a barn, for example—in the city, a peculiar pattern of cross-streets or overhead railroad tracks, monuments, and so on. But above all, the teacher should not worry about boring the students by asking "Where are we, and how do you know?" The question is always relevant on a geographic field trip, since more sophisticated questions are usually impossible until the elementary fact of location is settled.

Mechanics of the Trip

The primary aim of any good field trip is intellectual; it follows that the mechanics of the trip should be arranged after the intellectual goals are determined, and should always be kept subordinate to them. Seemingly minor mechanical problems, however, can easily disrupt an otherwise well conceived trip. The following check-list of "do's" and "don'ts," therefore, is aimed to help reduce the chances of mechanical difficulties. If some of these suggestions seem insultingly obvious, I beg the reader's pardon. Some which seem most obvious to me now have not always seemed so obvious, and it may be that some have escaped the reader's attention.

Staying businesslike

Make sure that the students understand that a field trip is for business, and not just a pleasant excuse to escape from the classroom. I am

4. Mr. Gary Fuller, NDEA Fellow in Geography, The Pennsylvania State University, and sometime teacher in the Liverpool, New York, public schools.

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not arguing that a field trip should be unpleasant; quite the contrary. But there are many students who, through no fault of their own, have never been on a field trip where serious mental activity is expected. These students (and there are usually a few on any trip) should be set straight promptly. Obviously, too, portable radios, extraneous reading matter, and similar distractions should be banned from a field trip just as they are banned in the classroom. If private cars are used to transport the class (this is a bad practice as we shall see shortly), car radios should be shut off and kept off.

Make sure that the trip stays businesslike, by keeping the students' minds occupied with the business of the trip. The teacher can do this easily and effectively by maintaining a running commentary about the landscape en route. If the scenery does not lend itself to comment,[5] the time may be used to discuss what is coming next, or—if the group is riding in a bus—to look at maps and compare them with the landscape which the map represents. It is possible, for example, to mount an impromptu blackboard in the front of most buses, made of brown wrapping paper on cardboard backing, on which one can draw sketch maps and the like with soft colored chalk. If nothing else will serve, the students should be asked to locate themselves on the map at any given point on the trip. Above all, the teacher should eschew long periods of saying nothing. Students will inevitably conclude that there is nothing worth looking at (a poisonous notion to any right-thinking geographer), and their attention will wander. Incidentally, the teacher should not worry about repeating himself when commenting on the passing landscape—say from a bus window. Landscape is repetitive, simply because patterns repeat themselves both in cultural and physical geography.

Schedule

Don't let things drag. This can best be avoided by careful advanced planning of a detailed itinerary and prearrangement of stops at interesting places. (Frequent short stops are better than a few long ones.) I do not mean, of course, that field trips should be run on a schedule of Prussian precision, but it is essential that a teacher have an itinerary, and a realistic idea of how long it will take to cover it. Otherwise, he will begin by dawdling, and end the trip at a dead run, with students who are first bored and then actively irritated.

However the schedule is arranged, it should contain enough slack to allow stops at unexpectly interesting places, and to accommodate delays due to traffic jams and the like. But the main source of delay on too many trips are the chronic laggards; if the teacher announces a fifteen minute rest stop, it should mean precisely that, and the straggler who wanders in after twenty-five minutes while the class waits for him should be instantly and publicly blistered.

Don't make the trip too long. This is addressed mainly to the enthusiastic teacher who, once he has his class in the field, cannot resist "just one more detour," or has planned a route which is longer than it ought to be. A good trip is extremely tiring, even when it is broken by frequent rest stops. It is better to cut off the trip too soon and leave the participants

5. This almost never happens, and if it does, it is likely the teacher's fault—not the fault of the landscape. A landscape about which an intelligent and well-trained geographer cannot make interesting comment probably does not exist. If the teacher thinks a landscape dull, it is probably because he himself is dull—or ill-prepared.

with an appetite for more, than to prolong it until the students simply turn themselves off through sheer exhaustion.

Comfort

Make sure the students are comfortable. This injunction has two simple corollaries: (a) plan the trip to include frequent toilet stops—one every three hours is an absolute minimum, and one every two hours is preferable if the teacher values the goodwill of his students; (b) try to avoid long trips without breaks. Students confined in busses for long periods tend to grow bored or stir-crazy, and both risks can be minimized if students are allowed to stretch their legs at reasonable intervals. Conversely, on a walking trip the students should be allowed to stop and sit down occassionally. Incidentally, any knowledgable teacher can sense when a class is getting itchy—on a bus or elsewhere. There should be no hesitation about short unplanned stops to give the students a chance to renew themselves.

These occasional breaks are vitally important in keeping students on their toes. A good field trip demands of students intense and constant attention. Nobody can keep up such concentration for very long without a rest, or simply a chance to clear the mind for further action. A twenty minute stop to loll beside the road and eat wild raspberries or to explore a run-down country antique shop can serve as humane and effective ways to recharge mental batteries.[6]

Comfort on busses calls for special remarks. There is such a thing as too much luxury, and some modern busses are so voluptuously padded that it requires an act of will for a student to stay awake, particularly after lunch, or early in the morning. Unless it is a very long trip, an ordinary school bus is commonly preferable to a Scenicruiser.

Even on the most luxurious vehicle, motion sickness is always a potential problem, and the wise teacher will try to anticipate it. (Most students will not complain until they are on the verge of becoming violently sick—and that is usually much too late.) Two simple measures will eliminate most of the difficulties: (a) place an absolute ban on pipe and cigar smoking, and extend the ban to cigarettes if the atmosphere shows signs of turning blue or turning students green; (b) announce in advance that anyone with propensities toward motion sickness should sit in front. Most sickness occurs in the back of the bus, partly because of motion, and partly because a queasy student often retreats like a wounded stag to an inconspicuous place—which is precisely where he should not be.

Food

Man must eat, on field trips as elsewhere, but mismanagement of eating arrangements can cause endless headaches. The main rule is simple: unless the class is very small, don't stop at restaurants except under gravest duress. To bring a busload of students into any restaurant (or even a diner), even if the management is warned in advance, is to invite a two-hour delay while the management prepares the food, untangles incorrect

6. Such unscheduled stops sometimes yield surprising byproducts. The ecology of a bramble-thicket may set off an impromptu discussion of plant geography which holds attention as no classroom lecture can, and I have seen obscure farm tools in antique shops provoke arguments about American frontier history which Frederick Jackson Turner might have admired.

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orders, separates the checks, and finally brings food to the student whose order was inadvertently (but inevitably) lost between the table and the kitchen. Then too, many students cannot afford to eat at even the cheapest restaurants. To avoid all these problems, students should simply bring bag lunches. (If need be, milk or soft drinks can be bought from a coin machine.) If the weather is clement and a pleasant picnic spot avails, the midday lunch stop can restore both body and mind—and not waste time either.

If one must stop at a restaurant en route (as sometimes happens on trips of several days length, where bag lunches are impracticable), it is wise to check with the management in advance to ensure that the restaurant can accommodate the group. Generally, service is faster if the group arrives either before or after the customary mealtime crush.

If one is compelled to take a group of field trippers to a restaurant, I strongly urge avoiding drive-ins or roadside chain restaurants, especially if the trip is concerned with any aspect of human (as contrasted with physical) geography. Even if we ignore the culinary sins of the average Hamburger Heaven, the local restaurant is still preferable, simply for what it has to teach a group about local culture. Reading a homemade menu is often an enlightening experience for those who are interested in regional or ethnic dietary habits,[7] and conversation with a waitress can be a rich source of local cultural or political mythology. Obviously, local restaurants can also yield cultures in the form of B. coli, and I am not arguing that one should poison oneself to ingest local color. But mass-produced Muzak (trademark registered) and mass-produced fried clams are not very edifying if one is interested in the way human cultures vary from place to place.

Pairing

Unless there are substantial objections, it is usually a good idea to ask students to work in pairs.[8] There are mechanical advantages to such an arrangement: if one becomes carsick, for example, or falls into a creek, or has failed to return when the bus is about to pull away from a stop, his partner can notify the leader. Doubling up also reduces the number of maps and other printed materials which must be available, thus cutting down on costs, and on clutter.

But the main advantages are intellectual. Two sets of eyes see more than one, and ideas occur to one student which may not have crossed the other's mind. If the two do not agree, the ensuing argument often develops ideas and insights to the benefit of both.

Transportation

Be extremely careful about transportation arrangements on any field trip. Vehicles which are supposed to be the teacher's mechanical servants, have a nasty way of taking over as Master of the Revels. ("Can't stop there; no place to park the bus.") The wise teacher can avoid a good deal of

7. I am fond of taking groups of field-trippers to lunch at a bucolic hotel in (Protestant) central Pennsylvania, where a displaced Jew serves pastrami, pork chops, and shoe-fly pie with impartial equanimity.

8. Some students are congenital "loners," and despise the idea of having to work in partnership with anyone. The wise teacher will respect the student's right to privacy, even if not to pipe smoking.

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potential trouble by heeding two general injunctions about the use of vehicles: First, if you can manage without vehicles, do so. Not only is walking cheaper than riding buses, it is far more efficient of field time—paradoxical as that may seem. On foot, a group that wishes to stop and look at something simply does so, without fuss or bother. To get a comparable group off the bus, assembled in a safe place where everyone can see and hear, quieted down, and back on the bus again, takes a minimum of ten minutes, and that does not count the time engaged in observation and discussion. Usually it takes longer than that, since there is rarely a place for a bus to stop at any reasonable distance from the thing one wants to look at and talk about. But the main deficiency of field-trips-on-buses is the absence of immediacy which comes from sitting in a padded seat watching the world rush by the window. The bus passenger is passive, and even on the best-run trip is the receptor of fleeting visual images. The walker, by contrast, is in contact with the environment all the time, with all of his senses. The walking tour sharpens senses; the interior of a bus tends to reduce the senses to mush. It follows, of course, that if vehicles must be used, the group should get out whenever there is anything really important to be seen and talked about.[9]

Second, if a vehicle must be used, do not use more than one. There are three excellent reasons for this injunction:

1. Two or more vehicles are easily separated, even in open country, and separation in city traffic is almost inevitable. When a trip expands to three or four cars, more time is usually spent looking for other cars than looking at the landscape. Walkie-talkies may help alleviate this problem, but reliance on electronic gadgetry is precarious at best, especially in cities.
2. On a well-run field trip, the leader is in constant communication with the participants. There are few things more frustrating than being a student riding in a car full of other students, with the teacher riding in the car ahead, seeing him pointing out interesting things, but having no idea of what he is saying. Again a walkie-talkie may help, but not much.
3. There are intangible but important advantages in having everyone together in one place—that is, on the same bus. There is simply no substitute for face-to-face confrontation between student and teacher, especially when the teacher is trying to communicate complex ideas—a situation which is not unusual on a good field trip. Students can ask questions on the spur of the moment, prompted by something they saw in passing, but they must be answered quickly to be any good. Such questions do not age well, and pass from the mind as the object-of-interest disappears behind the bus. Nor, of course, must all communication be verbal—a look of puzzlement, an eyebrow raised in skeptical inquiry, or a sudden grin which signals complete understanding: all important, but utterly impossible unless the student and teacher are face-to-face. And of course, a teacher who is enthusiastic about field work

9. General Motors or Ford or somebody should mass-produce a standard bus with a retractable top—something like the Nineteenth Century horse-drawn omnibus, or the de-roofed airport limousines which haul tourists around Glaciar and Yellowstone National Parks in the summer. There is no inherent reason why individuals—but not bus passengers—can ride in convertibles.

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cannot help but communicate his enthusiasm to the students, but he cannot do that if half of his students are three hundred yards behind in another vehicle. Dispersion of students among several vehicles simply makes for bad field trips.

Communications

Make sure that all students can see what is going on at all times. If the class is riding in a bus, make sure that the bus has adequate windows; many "modern" buses have small windows, often deeply tinted, and should be avoided like the itch; the large untinted windows of the average school bus are ideal.[10] Make sure, too, that the students are all allowed turns sitting at the windows.

Make sure that all students can hear discussion and comment at all times. This, as we have seen, is a prime reason for having everyone in a single bus together. But in a large bus, especially if the windows are open, road noise often makes it impossible for the teacher to be understood more than two or three rows back—thus leaving perhaps two-thirds of the class in ignorance of what is going on. Some buses are equipped with P.A. systems; if they are not, a portable system or battery-powered megaphone should be brought along. If a teacher has never used a P.A. system on a moving bus, however, let him be warned that they are far from ideal: the average system sounds like a quacking duck from the back of the bus unless the teacher has become familiar with the idiosyncracies of his particular system and has learned to cope with them. It is vital, therefore, that the teacher test the equipment well in advance of the trip, to make sure that it is working, and that he knows how to use it. It is equally necessary that the teacher keep checking with the students at the back of the bus to make sure that his voice is getting through. To the speaker, a system may sound as if it is working, but to those at the back of the bus the voice may be unintelligible. Students are too often reluctant to complain and will seldom tell the teacher that anything is wrong unless they are asked directly.

And In Conclusion...

A good field trip in geography can be a superb educational experience, but only if it is well planned and well run. Unfortunately, good geographic field trips are rare, while bad ones are very common. This essay has argued that any competent geography teacher ought to be able to run an excellent trip through almost any region or landscape, provided that he pays attention to a number of simple but often ignored precepts.

As a result, this essay has emphasized rules: what to do, and what not to do if a teacher wishes to produce a "good" field trip. No sensible

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10. It is a rich emotional experience for a teacher to point out casually the diagnostic red color of a particular geologic formation from a moving bus, only to discover that the green tinted windows have turned the outcrop a dirty gray. From what I can gather, the Greyhound company designed tinted windows in order to prevent passengers from seeing too much, thus inducing somnolence among potentially obstreperous patrons. Significantly, the bus *driver*, who is supposed to stay awake, is provided an untinted windshield. The moral should be obvious to any teacher who wants his students to stay awake on a moving bus.

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teacher, however, will follow these (or any other) rules with grim inflexibility, simply because no field trip is likely to be both good and grim simultaneously. A first-rate field trip is an intellectual experience of a high order, but the best trips are also gloriously enjoyable. The American myth that intellect and pleasure are incompatible—that scholarship is for Calvinists only—if untenable after anyone has experienced only one good field trip.

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